

# The Mining Journal

Established 1835

Railway & Commercial Gazette

Vol. CCXXXVIII No. 6074

LONDON, JANUARY 18, 1952

PRICE 8d

## COMPLEX AND LOW GRADE MATERIALS\*

*are treated on toll  
or bought outright  
by*

## Capper Pass

\* containing principally TIN and/or LEAD whether  
free from or combined with any of the metals  
Copper, Antimony, Bismuth and Silver.

*Send samples to us at Bristol*

# CAPPER PASS

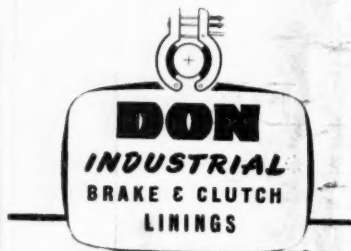
& SONS LIMITED

BEDMINSTER SMELTING WORKS      BRISTOL

**TO KEEP UPKEEP DOWN!**

"DON" Industrial Friction Fabrics reduce maintenance problems—designed and developed in an extensive range of qualities to suit the strenuous conditions of mining. "DON" has unquestionably proved its stamina, resilience and durability in successful application to colliery winding, haulage and handling equipment.

Always specify "DON"



**SERVICE DEPOTS**

**BELFAST:** Phone 25103  
**BIRMINGHAM:** Phone Aston Cross 1447  
**BLACKBURN:** Phone 6581  
**CARDIFF:** Phone 2326  
**CARLISLE:** Phone 589  
**CHESTER:** Phone 21280  
**COVENTRY:** Phone 64914  
**EDINBURGH:** Phone Central 4234  
**GLASGOW:** Phone Central 4595  
**HULL:** Phone 32381

**LEEDS:** Phone 20644.5  
**LIVERPOOL:** Phone Royal 5202  
**LONDON-LEYTON:** Phone Leytonstone 6068  
**WIMBLEDON:** Phone 424E(f)  
**MANCHESTER:** Phone Blackfriars 0596  
**NEWCASTLE-ON-TYNE:** Phone 27142 & 27942  
**NOTTINGHAM:** Phone 43646  
**SHEFFIELD:** Phone 25529  
**SOUTHAMPTON:** Phone 71276  
**STOKE-ON-TRENT:** Phone Stoke-on-Trent 44021  
**REPUBLIC OF IRELAND: DUBLIN:** 35 Westland Row. Phone 66597

SMALL & PARKES LTD., HENDHAM VALE, MANCHESTER 9 Phone: COLLYHURST 2511

**WOLVERHAMPTON DIAMOND  
DIE & TOOL Co. Ltd.**

**BOARTS  
and  
INDUSTRIAL  
DIAMONDS  
Exporters**

**11 HATTON GARDEN,  
LONDON, E.C.1**

Telephone: HOLborn 3017 Cables: Pardimon, London

**AN ANSWER  
TO RISING  
COSTS**

"Stream-Line filters enable us to use first grade oil over and over again, with a big saving in maintenance charges—increased running efficiency and longer periods between overhauls. 40,000 other users are proving every day the value of Stream-Line filters in the trouble-free operation of diesel engines."

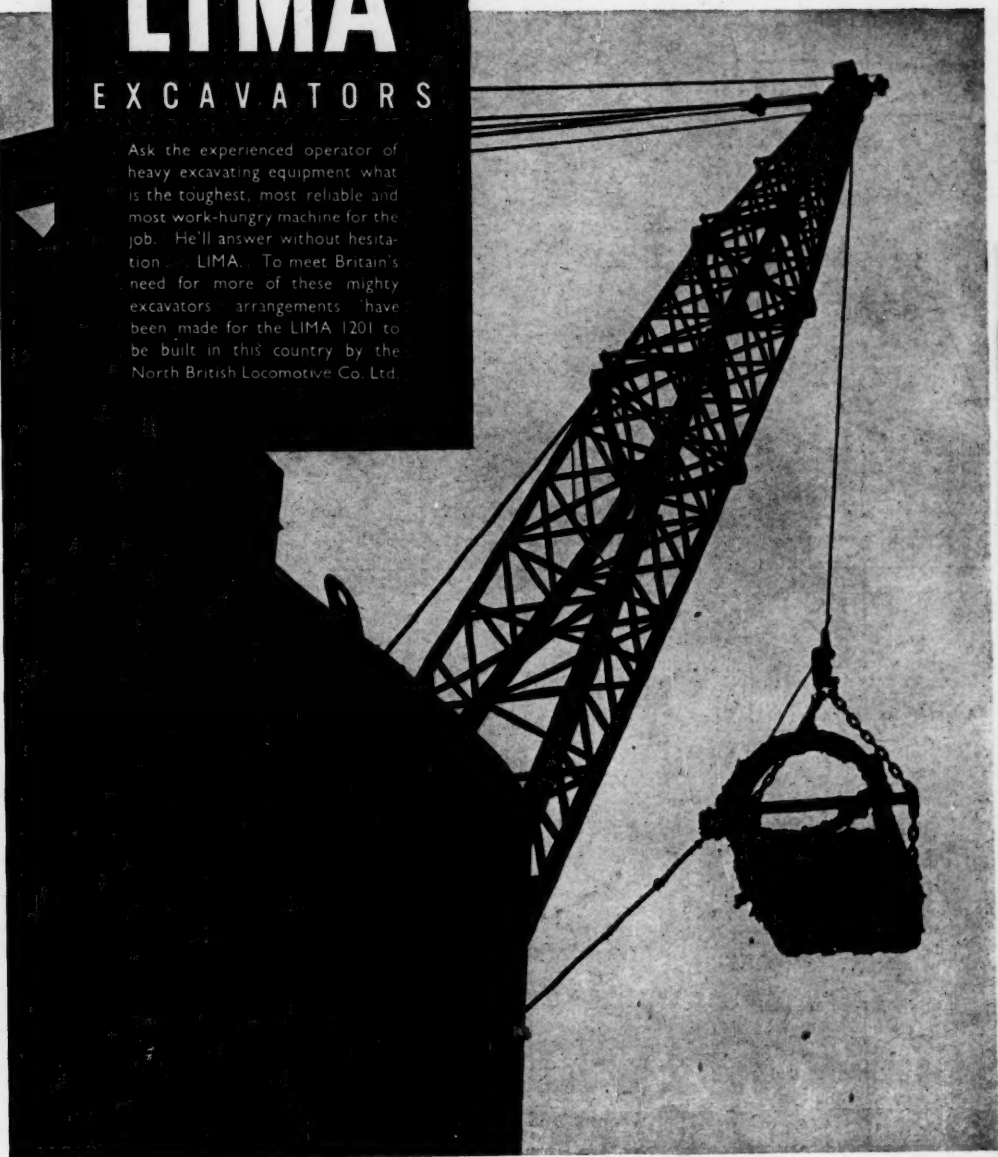
**STREAM-LINE FILTERS LTD**

INGATE PLACE, LONDON, SW1 TELEPHONE MACAULAY 1811

# LIMA

## EXCAVATORS

Ask the experienced operator of heavy excavating equipment what is the toughest, most reliable and most work-hungry machine for the job. He'll answer without hesitation... LIMA. To meet Britain's need for more of these mighty excavators arrangements have been made for the LIMA 1201 to be built in this country by the North British Locomotive Co. Ltd.



**JACK OLDING & CO. LTD. • HATFIELD • HERTS**

TELEPHONE : HATFIELD 2333

# The **D.P.** Rotary Pneumatic

## DRILLING MACHINE



TYPE D.P. 21

Other D.P. equipment includes:

Automatic Valves  
Ventilating Fans  
Pneumatic Picks

ONE of the most remarkable machines introduced to the mining industry. It is used for boring shot-holes in coal and soft stone, and works on the rotary principle. Using compressed air, it is absolutely safe in operation, while its light weight and ease of handling, together with entire absence of recoil and vibration have made it deservedly popular with the men, it being preferred to the percussive type of drill. It is used in conjunction with special drilling bits which enable it to drill in practically any coal. A trial is recommended.

DP/11



**dollery and palmer**  
LIMITED

38 Victoria Street, London S.W.1

Telephone: ABBey 7166 (2 lines)

Telegrams: Deflection, Sowest, London



**GOLD . . . ASBESTOS**  
**CHROME ORE . . . COAL**  
**MICA . . . BERYLLIUM**

*are some of the important minerals which  
now contribute to the rapid development of*

## SOUTHERN RHODESIA

*Land of Enterprise and Opportunity*

Between 1898 and 1950 the value of all minerals produced in this British self-governing country in South-Central Africa was

**£257,063,700**

*For the free booklet*

**"SOUTHERN RHODESIA: A FIELD FOR INVESTMENT"**

*apply to*

The Office of the High Commissioner,  
Rhodesia House, 429 Strand, London, W.C.2



*It depends what  
you mean by  
'Banking'*

OF COURSE we safeguard money and cash cheques. But we go further. We maintain specialist departments whose functions, although not 'banking' in the usual sense, can nevertheless be used to very good purpose. These departments will, for example, act as your Executor, help with your Income Tax problems, obtain your currency when you travel abroad. They will do many more things besides. But the moral of this multiplicity of functions is simply this: if you have *any* problem of finance or business, the chances are that we can help you deal with it. And that is what we mean by 'banking'.

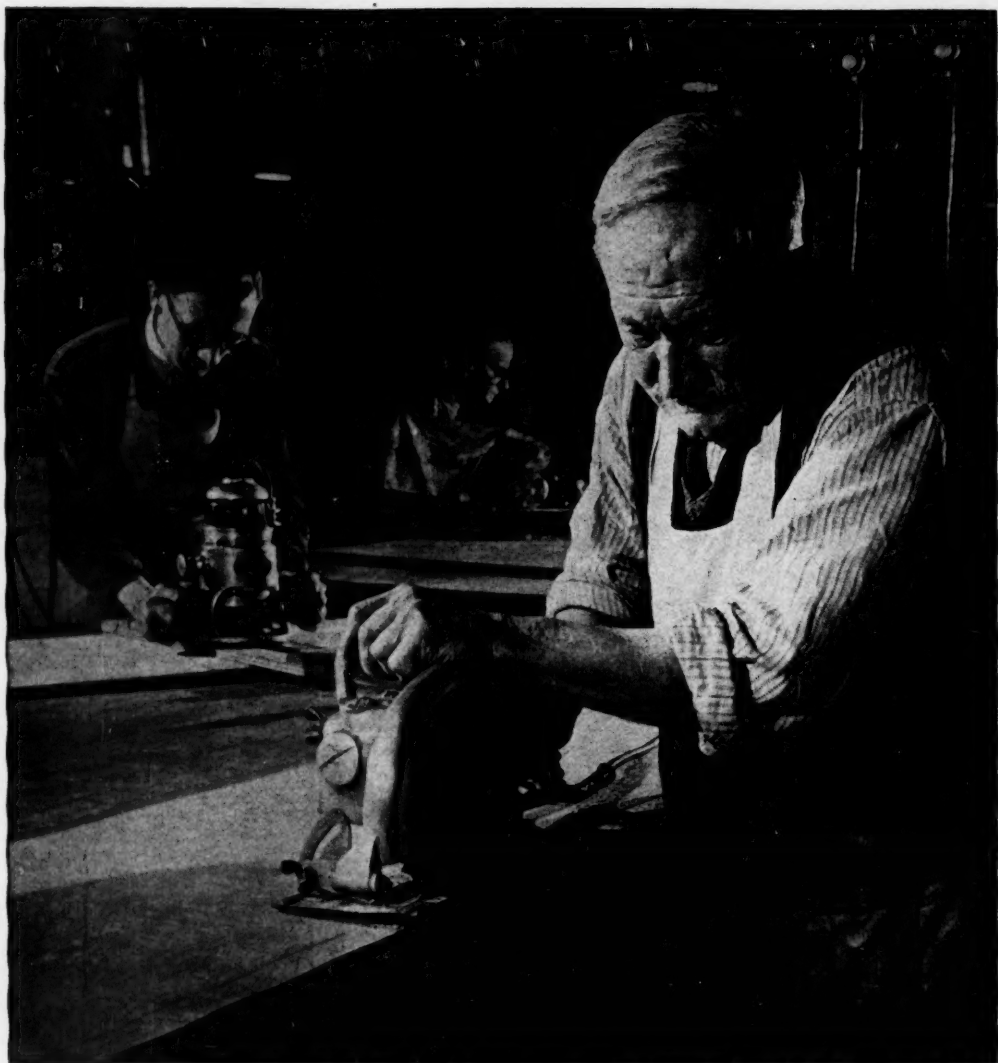
**WESTMINSTER BANK LIMITED**

WHEN A JOB NEEDS BUSINESS

WITH STRENGTH...

AND EXACTITUDE

PUT Aluminium FIRST  
AND TI IN FRONT OF IT



*Trimming and finishing plywood with electrically powered hand tools at Thames Plywood Manufacturers Limited*

## More power to his elbow

**GREATER PRODUCTIVITY** means more output from each worker, but there is a limit to what a pair of hands can do unaided. Put power into them and there is a different story to tell. Electrically powered hand tools—saws, drills, sanders, grinders and the rest—can multiply many times the output of the worker who uses them. Easy to use, instantly plugged in wherever they are needed, they *save time and toil, and make the most efficient use of the available power supply.*

### WHERE TO GET MORE INFORMATION

Your Electricity Board will be glad to help you to get the utmost value from the available power supply. They can advise you on ways to increase production by using Electricity to greater advantage—on methods which may save time and money, materials and coal, and help to reduce load shedding. Ask your Electricity Board for advice: it is at your disposal at any time.

## Electricity for **PRODUCTIVITY**

*Issued by the British Electrical Development Association*



## **'NOBEL-GLASGOW'** **Explosives and Accessories**

There is a 'Nobel-Glasgow' explosive for every blasting operation.

Users are invited to apply to the Nobel Division of Imperial Chemical Industries Limited for assistance with their problems.

**IMPERIAL CHEMICAL INDUSTRIES LIMITED**  
**NOBEL DIVISION, 25 BOTHWELL STREET, GLASGOW, C.2**





*In the tradition  
of things well done*

Down the centuries, the art of the gold and silversmith has ranked among the finest in the world and today it provides a valuable source of revenue from Overseas markets, where demand for this fine craftsmanship is heavy. Karachi, situated in the Sind Province, is famed for this kind of traditional work and, like so many centres of Eastern commerce, its industrial and domestic banking needs are served by the National Bank of India. For almost a century the National Bank of India has continued to further the interests of those concerned with Eastern trading and is, in consequence, well equipped to advise on any such matters. Your enquiries will be welcomed at the Head Office of the Bank, or at any of its branches.

### NATIONAL BANK OF INDIA LIMITED

*Branches in:* INDIA, PAKISTAN, CEYLON, BURMA, KENYA, UGANDA, TANGANYIKA, ZANZIBAR AND ADEN.

*Bankers to the Government in:* ADEN, KENYA COLONY, UGANDA AND ZANZIBAR.

*Head Office:* 26 BISHOPSGATE, LONDON, E.C.2.

## SCRAP SHEARS

- Range of Machines specially designed for rapid cutting-up of Metal Scrap.
- Hundreds in use.
- Possess the stamina for continuous high speed duty.

**Morrison, Marshall & Hill  
LIMITED**

44/45 TOWER HILL, LONDON, E.C.3

Telephone: ROYAL 1461

### Announcing

## ECONOMICS OF SOUTH AFRICAN GOLD MINING

### A TEXT-BOOK FOR THE NON-TECHNICAL MINING INVESTOR

Published in Johannesburg, it is written by two accountants in collaboration with a geologist and a mining engineer, who explain how to make full use of the wealth of geological, mining and statistical data put out by the mining companies.

Describes clearly with the aid of simple diagrams:—

- the geological systems of the Rand and O.F.S.
- modern prospecting, mining and ore treatment methods
- sampling, assaying and estimation of ore reserves
- compilation and interpretation of company reports and accounts
- Government lease payments and tax formulas
- the nature of gold shares and the factors affecting their value

*Copies obtainable from:*

**The Mining Journal**

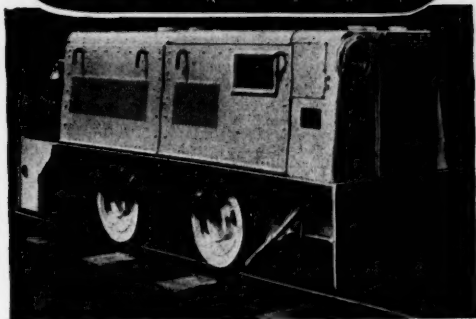
15 GEORGE STREET, LONDON, E.C.4

Price 42 shillings post free

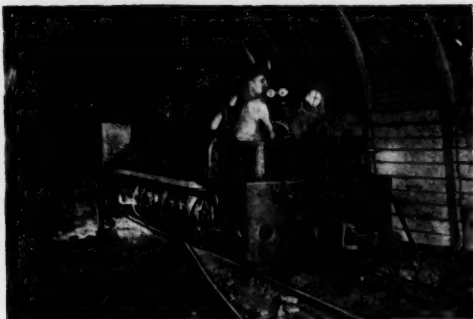
*Money will be refunded if book returned undamaged within 7 days*

# HUNSLET

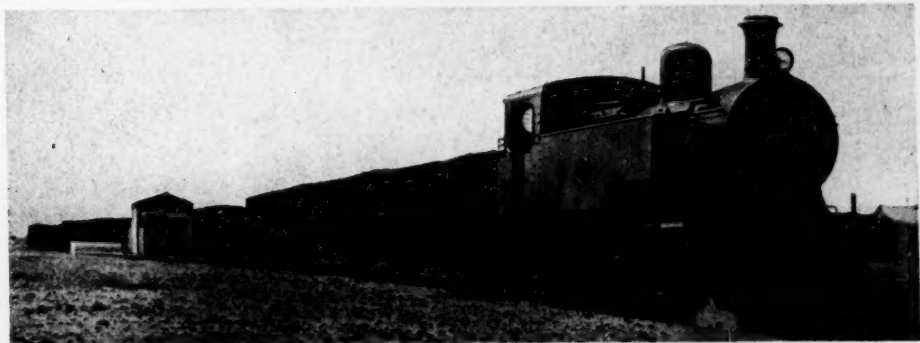
# LOCOMOTIVES



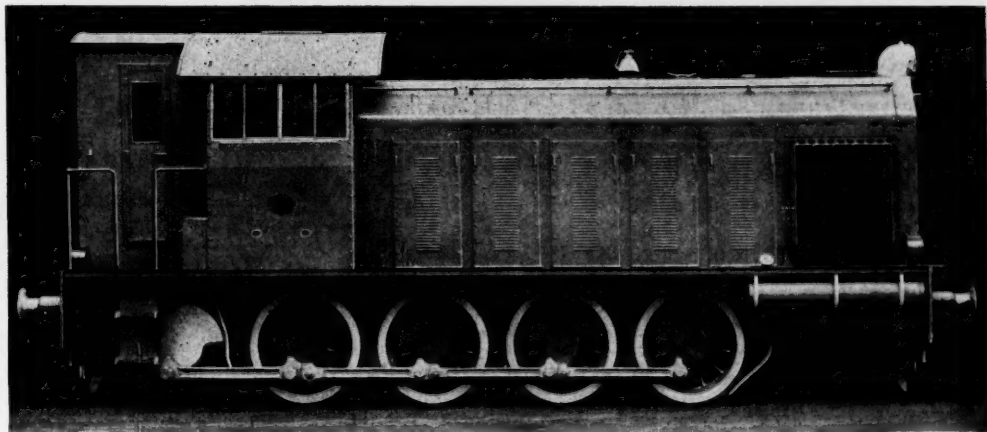
*The latest Hunslet underground diesel; 45 h.p.  
5 tons, 10 m.p.h.*



*Largest Hunslet fully-flameproof diesel; 100 h.p.,  
15 tons, 15 m.p.h.*



*48-ton Hunslet eight-coupled steam locomotive on 650-ton train, Nchanga copper mines, Rhodesia*



*Largest diesel-gear locomotive in the world; 500 h.p., 55 tons weight, for mineral trains and the heaviest shunting*

**Steam Locomotives**  
6 to 130 tons weight

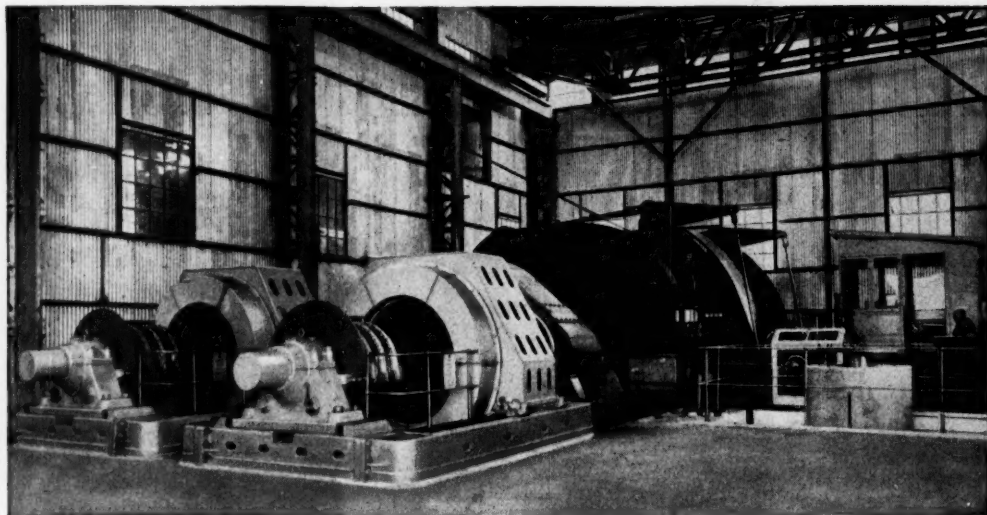
**All gauges**

**Diesel Locomotives**  
3 to 70 tons weight

**THE HUNSLET ENGINE CO. LTD., LEEDS 10, ENGLAND**

# 'ENGLISH ELECTRIC'

## mine hoists



### Twin Motor A.C. Mine Hoists

'ENGLISH ELECTRIC' pioneered the twin A.C. induction motor drive with series connected rotors for mine hoists.

By this outstanding development, the perfect load sharing of the twin motor drive is assured under all operating

conditions. 'ENGLISH ELECTRIC' twin A.C. motor drive has met with particular success in the extensive and progressive gold mining industry in South Africa where many large installations are now in operation.

**The ENGLISH ELECTRIC Company Limited**  
QUEENS HOUSE, KINGSWAY, LONDON, W.C.2  
Mining Division, Stafford

Works: STAFFORD • PRESTON • RUGBY • BRADFORD • LIVERPOOL

# The Mining Journal

Established 1835

Vol. CCXXXVIII No. 6074

LONDON, JANUARY 18, 1952

Price 8d.

## CONTENTS

Notes and Comments	65	Stillfontein; New Nife Mine Shaft Signalling Battery Units; Tornado T Type Dust Units.	
From Our South African Correspondent	67	Metals, Minerals and Alloys	74
Mine Haulage System in the U.S. Coal Industry	68	The Mining Markets	76
The Diamond Industry in 1950	70	Company News and Views	77
Reviews	72	Diamond Sales in 1951; Jos Tin Pays 20 Per Cent.	
Machinery & Equipment	73	Company Shorts	77
The Economic Limit of Lightweight Drilling Equipment; Bellis and Morcom Compressor at		Company Meetings and Announcements	78
Published by The Mining Journal Ltd. at 15, George Street, London E.C.4.		Rambutan Ltd.; Lake George Mining; Gold Coast Selection Trust; Harmony Gold Mining Co., Ltd.	
		Subscription £2 per annum (post free)	

## NOTES AND COMMENTS

### Why Steel is Scarce

In a carefully detailed analysis of the various causes which led to the failure of the steel industry to reach its target of 16,000,000 tons last year, the British Iron & Steel Federation ascribes a prominent place to the substantial diversion, to the iron foundries, of precious supplies of pig iron and scrap which could have been usefully employed in the production of steel.

That of course is not the whole of the story. There were deficiencies in the provision of coke for the blast furnaces, serious interruptions in the intake of foreign ore in the first half of the year, and a drop of over 1,300,000 tons in the arrivals of foreign scrap. But in the face of all these known difficulties it is argued that a more equitable distribution of available supplies would have avoided some of the difficulties with which the steel using industries are now confronted.

The estimate of steel production in 1951 is said to have been based on the assumption that the output of iron castings would not exceed 3,500,000 tons. The actual figure is believed to have been 3,750,000 tons. In other words, the foundry trades were permitted to increase their output by 250,000 tons and, in doing so, to conserve substantial extra tonnages of pig iron and scrap which would otherwise have been used to raise the level of steel production.

This raises an important question of national planning. It would appear that the control of the flow of raw materials into the iron foundries has been somewhat lax. Moreover, for many purposes, it is demonstrable that an enormous saving in weight can be achieved by the use of sheet steel in place of cast iron. These are questions which demand the immediate attention of the controllers. There is no time to wait for a change of administration after denationalization.

### Mining in Northern Rhodesia during 1950

No big metalliferous mining field in recent years has developed so fast as Northern Rhodesia which now ranks third among the copper producing countries. Serious mining and smelting of copper only started 20 years ago and in the year just finished fell little short of 300,000 tons.

Unfortunately where progress is so rapid official information is apt to lag somewhat and the report of the chief inspector of mines, Mr. J. R. Fawdry, for the year 1950, has only just reached us. The figures of production which it presents were published in our *Annual Review* number of May 1951; consequently Mr. Fawdry's report is of interest chiefly as a background to the production statistics.

In 1950 the total value of the mineral production was £49,323,357, an advance of £13,943,814 on the previous year. Advancing prices in the metal market were responsible for most of this gain though there was an increase in the copper output of 17,152 tons. Zinc and lead, the other two important metals, showed little change. Cobalt, however, with an output of 1,746 tons of cobalt alloy was valued at over £1,000,000. The four copper producers Mufulira, Nchanga, Nkana and Roan Antelope, together with Rhodesia Broken Hill accounted for just on 98 per cent of the total mine labour force so that apart from them, Northern Rhodesia's mining industry is of no great importance.

During 1950 the supply both of European and African labour was adequate—the total numbers employed at the end of the year being 3,345 Europeans and 40,495 Africans from which it will be seen that the ratio of white to native labour reached the high proportion of 1 to 7.58 as compared with 1 to 24.8 in Southern Rhodesia. In correspondence with the general atmosphere of expansion, native wages underground were advanced from 64s. to 71s. 11d. a month and compared with 40s. at the end of the war. Out of a total of about £17,000,000 spent by the mining industry in the country, the wage bill totalled £6,867,007. The African labourers are now apparently capable of undertaking a certain amount of semi-skilled labour as 219 blasting certificates were issued to natives and 36 are holders of certificates for small winding engines. Moreover, boss boys formed the main link in safety training of the more inexperienced labour, in addition to which regular instruction in safety methods of working, propaganda broadcasts by loud speakers in the African quarters and flashing signs illuminating safety slogans prove very effective underground. Silicosis is an occupational mining risk here as elsewhere and 3,000 Europeans and over 19,000

Africans were medically examined and 12 Europeans and 90 Africans certified as fresh cases.

While non-fatal accidents showed an increase last year, fatality rates were definitely lower; that for Europeans being 1.33 per thousand and for natives 1.06, out of a total labour force of 41,528. It is interesting to note that one African mine worker was awarded the George Medal for conspicuous bravery underground.

Mining practice showed a further increase in the use of long drill holes for stoping, chiefly with diamond drills. At three of the four copper mines virtually the whole of the stoping was so operated that the drilling can not only be done from comparative safety, but kept well ahead of blasting. A considerable amount of work was continued to induce caving of hanging walls to relieve pressures on working areas and to lessen the open area of completed stopes liable to give rise to air blast when they finally cave. While no new rock drills were introduced during the year there was a substantial increase in the footage drilled for blast holes which totalled 3,404,180 ft. There was widespread adoption for percussion rock drills of tungsten-carbide tips, which resulted in the supersession of surface drill sharpening shops by grinding wheels, enabling the sharpening to be done wet, while of course much greater footage is obtained without the need of re-sharpening. Where diamond drills are employed the creation of dust is much lessened.

### Mining Developments in Italy

It is well known that Italy, so richly endowed in other respects, is poor in minerals; she is normally self-sufficient only in mercury, sulphur, talc, zinc, pumice, marble and building stones. In addition, she can meet most of her normal requirements of lead and iron ore. Although these products provide some very useful exports (especially in the case of sulphur, mercury, zinc, and marble), they do not compensate for the much larger imports of other mineral raw materials on which Italy's industry depends.

Mineral production since the war has been well below pre-war levels and, although 1948 saw some recovery in several sectors, the industry as a whole is in a depressed state. However, production of natural gas is a notable exception. High costs of production, lack of capital and modern equipment, account for this situation, together with difficulty in resuming pre-war export trade. This is the gist of the section on mining contained in a recent report on Italy, compiled by Mr. E. R. Lingeman, C.B.E., H.M. Minister (Commercial) at Rome, and published for the Board of Trade, *Overseas Economic Surveys*. (An article on Italian mining in 1950 appeared in *The Mining Journal*, May 25, 1951.)

Production of sulphur has been below pre-war levels owing to high costs of production, the near exhaustion of many of the mines and, until recently, lack of demand. These factors combined to make capital investments for re-equipping the mines with modern machinery unattractive. Production of raw fused sulphur in 1950, however, recovered to approximately 213,000 tonnes, compared with 189,000 in 1949 and 380,000 in 1938; since the summer of 1950, when the world shortage of sulphur began to be felt, production has been running at the rate of some 200,000 tonnes per annum. However, it seems unlikely that this rate can be substantially increased without the opening-up of new deposits and the installation of modern machinery in the mines. A programme exists for the expansion of production to 450,000 tonnes by 1954-55, involving the expenditure of 950,000,000 lire on exploration work and some 9 milliard lire on re-equipment.

Production of mercury in recent years has suffered from large stocks available both in Italy and in major importing

countries as well as from the opening of mines in North American countries during the war. Exports in 1948 and 1949 amounted to 1,091 and 292 tonnes respectively, compared with 1,839 tonnes in 1938. In 1950, however, they recovered to 2,838 tonnes.

The Italian aluminium industry can rely on certain supplies of low grade local bauxite, but shortages of coal, sodium hydroxide and electric power have restricted output in post-war years to considerably less than the capacity of the industry (55,000 tonnes a year). Bauxite is imported; of total imports in 1950 of 83,000 tonnes, 76,000 tonnes came from Yugoslavia. Total production in 1948 and 1949 is given by the Confindustria as 33,000 and 26,000 tonnes respectively; in 1950 it rose to about 45,000 tonnes. Exports of ingots amounted to some 17,000 tonnes in 1948, 4,000 tonnes in 1949 and about 3,000 tonnes in 1950. Copper is produced in Italy in a small way (2,000 tonnes in 1948). This compares with requirements of some 70,000 tonnes (including use for chemicals), all of which have to be imported. Production of lead and zinc in 1950 was around 37,000 tonnes.

It is interesting to note that according to a recent report from Milan, the chief features of the Italian non-ferrous metal market in 1951 were a substantial increase in zinc and aluminium production, a sharp expansion in exports of raw metals and a fall in imports of copper and copper alloys.

This export expansion was caused chiefly by the higher international demand for raw metals, which was met by additional output on the part of the Italian industry. Exports of aluminium bars, including secondary aluminium, showed a remarkable increase in the first ten months of the year to 10,400 tonnes, from only 2,400 tonnes in the corresponding period of 1950. However, copper provided an exception for exports of copper, and copper alloy semifabrics, were unable to rise above the low level of 1950.

Imports of tin rose sharply during the first ten months of 1951 to 4,100 tonnes, from 3,200 tonnes in the comparable period of 1950. Imports of nickel scrap, however, declined in the first eight months of the year to only 56 tonnes from 325 tonnes in the like period of 1950; imports of the raw metal also fell, to 430 tonnes from 617.

The supply position generally for non-ferrous metals was rarely acute during the year, however, and, except in the case of nickel and copper from time to time, there was no necessity to draw on stocks. Prices remained fairly stable and for some months were lower than those prevailing on the world free markets. Even now, if account is taken of incidental charges, Italian prices are no higher than those prevailing elsewhere.

Production in most cases responded well to the higher volume of demand. Zinc output in the first nine months of 1951 rose to 35,000 tonnes from approximately 28,000 tonnes in the like period of 1950, while production of raw primary aluminium reached 37,800 tonnes in the same period, compared with 29,900 tonnes. Zinc and lead output together are expected to pass the 80,000 tonnes mark for the year.

### Van Riebeeck—A New O.F.S. Town

A new town in the Orange Free State gold area has just been approved by the Administrator, Mr. J. J. Fouché. It will be called Van Riebeeck and will rise on the farm Nootgedacht 74 (4,000 morgen), about five miles north-east of Welkom. Van Riebeeck will, for the time being, be the last urban area to be laid out in the new gold area. On the first portion of 2,000 morgen, provision will be made for 35,000 European residents. The new town will be provided with water from the Vaal River and with electric current by the Electricity Supply Commission.

# South Africa

(From Our Own Correspondent)

Johannesburg, January 8

The outstanding feature of 1952 in the Union's gold mining industry will be the coming into production of four, if not five, producing mines. These will be West Driefontein, Stilfontein, Western Holdings, Virginia and possibly the new Ellaton mine of the Strathmore group, which lies immediately to the north of Western Reefs.

Furthermore, most of the Free State developers will intersect the Basal reef horizon and start underground development. This development will be closely watched in the hope that the results obtained will provide a few more clues to the puzzle of what the reef in the Free State actually is like. In the limited area so far developed considerable local concern both on the technical and financial front has been caused by faulting and water troubles. This year's work, however, should indicate the nature and extent of these troubles and whether or not they are likely to be encountered further afield.

## NEW GOLD PRODUCERS THIS YEAR

It is likely that during 1952 a number of new mining lease areas will be demarcated and, provided that capital funds are available, that a start with opening up further new properties will be made. In the Orange Free State, the two chief areas to be opened up are the La Riviera ground immediately to the north of Harmony, where drilling results have been most encouraging, and the Van Den Heever's Rust area, where it is expected that the "Rainbow" reef formations will be exploited, although these are still much of a jig-saw puzzle from the geological point of view.

The Klerksdorp area may well prove to be the scene of a great deal of activity. It should not be long before a start is made with shaft-sinking in the Lucas Block, immediately to the south of Stilfontein, which can support two, if not three, mines. There is also Vaal reefs, where the Vaal Reef has been intersected in the sub-vertical shaft; the Ellaton mine mentioned earlier and Middle Wits, where if fresh borehole results match up with earlier results obtained, it may be decided to open up the Klerksdorp Townlands area as a deep level proposition.

## KEEN COMPETITION FOR LABOUR SUPPLY

The shadow of rising working costs and the shortage of labour, both European and African, still hangs over the producing mines. On the costs side, there are indications that the authorities are becoming aware of the dangers inherent in the continued inflationary trend and they may possibly take a leaf out of Britain's book and apply more direct measures to combat it, such as increasing interest rates all-round and curtailing credit facilities. Unfortunately, the adoption of such measures in the immediate future is not only a question of economics, but also of political expediency, as the Government is faced with a general election in the middle of next year.

The labour problem is likely to continue to be much in evidence and shows no signs of solution in view of the keen competition for the existing supply by the primary and secondary industries. Admittedly, the new mines, in particular, are making determined attempts to economize on native labour by increased mechanization, but much of this is marginal. Neither is there much saving in net costs by using a small labour force when depreciation of machinery is taken into account, together with maintenance costs and the wages of European mechanics, of whom there is a great shortage.

The current year looks as if it will also be a most interesting one for asbestos and platinum. During 1951, the exploitation of asbestos went ahead by leaps and bounds and it looks as if this was the start of what may well develop into a boom on its own.

## OUTLOOK BRIGHT FOR ASBESTOS

South Africa is blessed with extensive deposits of asbestos fibres of all descriptions in all provinces except the Orange Free State. Until very recently, however, mining activities were limited to deposits containing the very long fibres, as the demand for the short varieties was small. But this has now changed, as asbestos in a variety of forms is now used as the major protection from the heat blast of atomic bombs and other modern war weapons. Consequently, there is a great demand for all types of fibre, even those less than  $\frac{1}{4}$  in. in length. Modern techniques have now been developed for cleaning fibres, which have made it possible to market fibres previously considered expendable owing to the presence of foreign substances. The rate of expansion is reflected in the fact that the value of the first nine months' output last year amounted to more than £4,200,000 compared with £3,623,000 for the whole of 1950.

## RUSTENBURG PLATINUM'S EXPANSION PROGRAMME

This year will see the expansion programme of the Rustenburg Platinum Mines getting into full stride, and this will reach its peak over the next two years. For strategic purposes it has been decided to stop the publication of output figures so that it will not be possible to discover exactly the amount of the proposed increased production. It is known, however, that during this year the milling rate of the two sections at Rustenburg will be stepped up to 102,000 tons a month and subsequently the capacity of the Rustenburg plant will be increased by a further 25,000 tons a month.

At present it takes approximately nine months for platinum recovered here to reach the markets. So that it will take some time before the effects of increased output will be felt on the market. The policy of the industry is to keep the supply as high as possible in order to maintain a stable market for the metal at a reasonable price. It would seem that they are most hopeful of achieving this in view of the plans now being prepared for the erection of a refinery at Rustenburg, which will mean that only the final treatment will be done in London.

The Rustenburg mines are exploiting the Merensky reef, which occurs in a long line in the Bushveld Igneous Complex.

## PROSPECTS IN THE LYDENBURG AREA

An interesting development is the likelihood of the deposits in the Lydenburg area being opened up in the near future. It may be recalled that it was these discoveries that touched off the ill-fated platinum boom in 1926. Production was actually started, hence the existence of Potgietersrust Platinum and Lydenburg Platinum companies, but this ceased when the market for the metal collapsed with the sudden flood of Russian platinum and its production as a by-product by the International Nickel Co. of Canada.

Generally speaking, the reef in the Lydenburg area lies at very shallow depths—often less than 100 ft.—and recent assays yielded values between 4.46 and 7.86 dwt. per ton over workable reef widths.

In the 1920's Dr. Wagner in his memoirs estimated that the pay limit was around 1 dwt. per ton, and even allowing for the rise in costs since then, these deposits would appear to be economic propositions. It is, therefore, quite possible that new mines may be opened up in this area.

## AMERICAN COAL MINING INDUSTRY—III

# Mine Haulage System in the U.S. Coal Industry

The extensive use of locomotives in American coal mines was a special subject of study by the British Productivity team which visited America in February and March of last year. The team's views and comments on U.S. mine haulage practice and recommendations for the British industry form the basis of the following article, the material for which was taken from their report entitled "Coal," published by the Anglo-American Council on Productivity. A brief description of current roof bolting developments in the United States is also given in the following article.

The almost universally adopted room-and-pillar system of working in America involves the haulage of coal from a number of points spread over a wide area; and, because of the rapidity of the advance which this method of working allows, the haulage distance also increases rapidly. For these conditions and requirements locomotive haulage has outstanding advantages in flexibility for it is easy to switch locomotives from one section of the mine to another to meet changes in the distribution of output and to deal with an expansion in the total mine output by increasing the number of locomotives up to the limit which the traffic system can bear.

Some indication of these possibilities may be gauged from the locomotive equipment of the largest mine in the U.S., which the team visited, and where, to handle an output of some 18,000 tons a day there were no less than 126 locomotives in use underground of which 16 were of 18 tons, 16 of 12 tons, 71 of 7 tons and 23 of 5 tons weight. The 18 ton and 12 ton locomotives were used for main haulage, each of the 18 tonners having motors totalling 250 h.p.

## ADVANTAGES OF LOCOMOTIVE HAULAGE

In addition to the advantages of flexibility, locomotive haulage also brings all the advantages of large capacity, namely, the elimination of bottlenecks that hinder the smooth flow of coal from the face and high efficiency in terms of tons, or ton-miles, per man employed on haulage.

As previously pointed out, in the American system of mining it is not unusual to find several parallel entries in the intake air so that it is possible to adopt single track working for the main haulage with separate roads for each direction of traffic. This is particularly advantageous for working in the thinner seams as it makes possible the use of wide mine cars and the achievement of high haulage capacities in spite of the reduced head room.

The possible sources of power for locomotive haulage are the internal combustion engine, compressed air and electricity. However, the use of Diesel locomotives underground is forbidden under U.S. State Regulations and with the use of compressed air out of the question on the grounds of cost, the field has been narrowed down to the electric locomotive powered either by batteries or by current taken from an external source. The disadvantage of the battery locomotive is that long hauls call for large battery capacity and high rates of energy consumption. For this reason the trolley system has been generally adopted for main and secondary haulage. On the other hand, trolley locomotives involve the use of bare conductors and the risk of open sparking and it is therefore essential that fire damp shall not be present in dangerous concentration.

## GATHERING HAULAGE

The first stage in haulage is the gathering system used in conjunction with the loading arrangements at the coal face. In bituminous mines power loading is being adopted generally. The gathering system is sometimes provided by conveyors, as in longwall working in Britain, and sometimes the coal is loaded directly into mine cars. Much more

commonly, however, shuttle cars are used for the gathering service from the loading machine to the secondary haulage and even, in some cases, direct to the main haulage. Shuttle cars usually take their power from the overhead trolley wires through flexible trailing cables on reels carried on the vehicle. Although the practice of connecting these subsidiary circuits through permissible switch-gear is being adopted increasingly, the older method of using special hooks, called clips or nips, often without protective fuses, is still frequently employed. Each shuttle car is driven by its own power unit, which also serves to operate the short conveyor on the loading boom for discharging the coal to the secondary haulage. Where conditions are considered to be unsatisfactory for trolley wires or trailing cables, shuttle cars are battery-powered. Capacities vary up to a maximum of seven tons.

So that the continuous mining machine or power loader may operate without interruption while the shuttle car is making its trip from the face, it is often necessary to provide surge capacity. At the mines we visited shuttle cars were themselves used as intermediate surge bins. In some cases small battery or trolley locomotives are used for gathering haulage. The empty mine car is hauled to the power loader and then, after filling, back to the secondary or main haulage section.

A new and seemingly very promising development for continuous gathering haulage is the conveyor train referred to in the previous article, which, being mounted on wheels, can follow the loader or continuous mining machine under its own power. The delivery end is fitted with an adjustable loading boom.

## SECONDARY AND MAIN HAULAGE

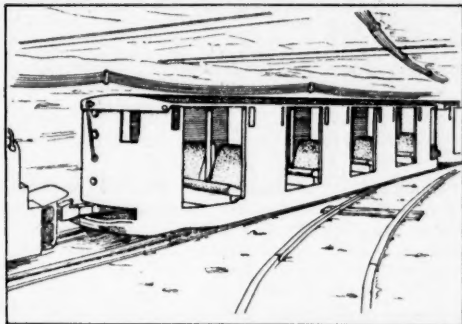
For the secondary haulage, between the gathering unit and the main line, trolley locomotives are employed whenever possible. Sometimes there is no secondary haulage at all, and the gathering units feed the main road haulage directly. The use of trolley locomotives for secondary haulage means that in many instances bare overhead wires have to be brought very near to the working faces. In some States, regulations now stipulate that this distance shall not be nearer than 150 feet from the entries. Nevertheless, there are, in fact, many mines in which trolley wires are installed closer to the face than this, sometimes even in return airways.

Conveyors, and particularly belt conveyors, are frequently used for secondary haulage, receiving the coal from shuttle cars and discharging it into mine cars at the end of the main haulage road. The standard of installation and maintenance is very high, making it possible for belts to be reversed, so that they can be used to convey material inbye and to transport men in both directions. By this means the provision of additional men and equipment for an independent haulage is avoided.

So that greater tonnages may be transported over longer distances, the trend is towards introducing still larger mine cars and heavier and faster locomotives. The locomotives the team saw were of weights ranging from 5 tons to 20 tons, with horsepowers of up to 250 at the one-hour rating. The capacity of the motor is usually proportional to the locomotive weight in the ratio of about 10 h.p. per ton. The

smaller locomotives of less than 9 tons weight are generally used for gathering and secondary haulages. The speeds of main haulages vary up to 20 m.p.h., but are usually between 8 and 15 m.p.h. The operation of locomotives in tandem is not uncommon, and at one mine visited the team saw units each of 18 tons operating together in this way.

Signalling is usually arranged on the block system and interlocked with the operation of the points. In most mines considerable use is made of telephonic communication, and the development of the "trolleyphone" (attached to every locomotive and using the overhead power wire) has made



Special man-riding trains with sprung, covered-in cars

an important contribution in this direction. All instruments operate in parallel; a ringing code is used to identify each call with the person for whom it is intended and all communication is through the despatching station.

Although the team could obtain no figures to help them to assess in quantitative terms the effect of man-riding on productivity it appeared obvious to them that man-riding to the coal face must have a most beneficial effect on output and on the well being of the individual. The locomotive haulage system enables train loads of men to be run at any time during the shift as separate units interspersed between coal trains, thereby reducing interference with coal transport to a minimum. In some of the more modern and better equipped coal mines special man-riding trains are used with sprung, covered-in cars of the type illustrated above. Many mines, however, are not so well provided and man-riding entails travelling in ordinary mine cars, the men sitting on one side only—that remote from the trolley wire.

#### TRANSPORT FROM UNDERGROUND TO SURFACE

Only about 25 per cent of the deep mined coal mined in America is raised to the surface through vertical shafts. It is therefore pertinent to recall that, in general, shafts are much shallower than those in Britain and thus the small depths involved in vertical shaftwinding make the problem of haulage in large tonnages comparatively easy, in fact the majority of U.S. mines work one seam only from a single level, considerable use being made of skip-winding which is well adapted for hoisting heavy pay loads from shallow depths with considerable economy of man power. Outputs from slope mines are generally brought to the surface either by rope haulage or belt conveyor, while in drift mines the coal is delivered direct to the surface by the underground main line haulage system. At those mines where skip winding is used the transport of coal on the surface from the skip receiving hopper to the tippler is, of course, by belt conveyor.

In summarizing the American mine transport system the team felt that the best American transport practice served to underline the wisdom of British policy which recognized that the modernization of transport systems was a pre-

requisite of increased productivity. Here, the team recommended that the established British policy of giving high priority to the modernization of transport should be pursued still more energetically, particular attention being given to the following:

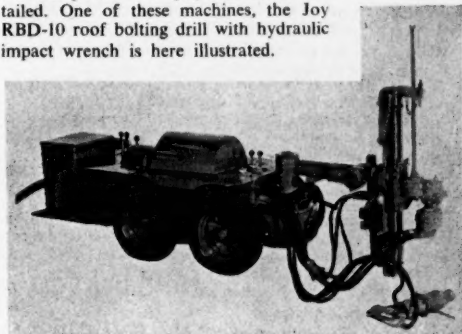
- (1) The installation of locomotive transport for both main and subsidiary haulage, wherever gradients and other natural conditions permit;
- (2) The introduction of electric trolley locomotives where conditions allow;
- (3) The use of mine cars, of the largest practicable capacity in conjunction with well-designed loading points;
- (4) The introduction of skip winding where practicable;
- (5) The layout and grinding of surface sidings so that shunting is eliminated as far as possible.

#### ROOF BOLTING

Although experiments with roof bolting were first carried out in America some 20 years ago it is only in recent years that it has become a practical proposition. More than 350 coal mines in eight major producing States are already using the system to secure approximately 63,000,000 sq. ft. of roof. Of these installations 75 per cent, which included all those mines operating the room-and-pillar system, have been put in operation since 1948.

The efficiency of high capacity machines for roof bolting both in use and in prospect depends, the report states, to a large extent on providing them with ample clearance so that they can move freely in confined working places uninterrupted by alterations to the setting of roof supports. Ideal conditions are those in which no props and bars are required. These conditions are created by roof bolting and the team reports that American engineers are giving increasing attention to its development.

American manufacturers of mining machinery have not lagged behind in these developments and have already placed on the market special drilling machines to bore the holes and power operated impact-wrenches to give uniform tightness to the bolts, to speed up the work and to reduce the manpower and physical effort entailed. One of these machines, the Joy RBD-10 roof bolting drill with hydraulic impact wrench is here illustrated.



The Joy RBD-10 Roof-Bolting Drill with Hydraulic Impact Wrench

Although the wide differences in natural conditions and mining methods make it unlikely that there will be any widespread application of roof bolting in Britain, there are mines in this country which research may prove to be suited to this method of support. In view of its operating advantages and of the shortage and increasing cost of conventional timber and steel supports, the team recommends that a survey should be made, based on American experience, with the object of introducing roof bolting in Britain wherever conditions allow.

# The Diamond Industry in 1950

By DR. W. F. FOSHAG and DR. G. S. SWITZER

The following is an abridgment of the 26th Annual Report on the Diamond Industry in 1950 compiled by the Curator, and Associate Curator, Division of Mineralogy and Petrology of the Smithsonian Institution, Washington, and published by *The Jewellers' Circular—Keystone*

The year 1950 was a record-breaking one in the diamond industry. Sales of diamonds by South African and other producers were the greatest in history, with total sales nearly one-third greater than the previous record year—1948—and nearly double those of 1949.

The rapid changes in the world situation have brought about a decided change in the diamond industry, both in the gem and industrial fields. The early lethargy of the market was changed to one of avid demand by the outbreak of the Korean war. Even before this event, an improvement became noticeable, due in part to the stabilizing effects of the Diamond Trading Company's action to maintain prices upon the devaluation of sterling currencies in 1949, and to the moves by various governments, notably that of South Africa, to eliminate manipulations between hard and soft currencies.

In the industrial field, too, the outbreak of the Korean war again emphasized the importance of the diamond in industry. American and other rearmament programmes greatly increased demand for industrial stones. By 1950, reserve stocks were reduced to 8,000,000 ct. No general serious shortage developed during the year, although the market tightened on some types, notably crushing board. The present outlook is for greatly increased demand, which will be partially offset by increased production from the Belgian Congo, and the reopening of the Premier Mine.

Other factors, such as the development of the Alberta, Canada, oilfields, created new demands for industrial stones. New recovery processes, heavy, media and electrostatic, have now proved their value, resulting in more efficient recovery of stones and lower recovery costs.

## WORLD PRODUCTION

Accurate figures regarding diamond production are not available for all countries. Exact figures received from official sources are given in most instances. Where estimates are given, they are believed to be fairly reliable.

### World Production of Diamonds, 1948-1950 (In metric carats, including industrial diamonds)

Country	1948	1949	1950
<b>Africa:</b>			
Angola .....	795,509	769,981	538,867
Belgian Congo .....	5,824,567	9,649,896	10,147,471
French Equatorial Africa .....	4118,300	4122,928	111,460
French West Africa .....	77,970	94,996	126,346
Gold Coast .....	1850,000	1,497,976	1,950,000
Sierra Leone .....	465,518	494,119	655,474
Southwest Africa .....	200,691	280,134	488,422
Tanganyika .....	148,169	191,787	195,274
<b>Union of South Africa:</b>			
Lode .....	2,930,000	964,266	1,516,194
Alluvial .....	2,270,000	2,289,756	2,311,674
<b>Total Union of South Africa .....</b>	<b>5,200,000</b>	<b>1,254,022</b>	<b>1,747,868</b>
<b>Brazil<sup>1</sup> .....</b>	<b>250,000</b>	<b>250,000</b>	<b>200,000</b>
<b>British Guiana .....</b>	<b>36,562</b>	<b>34,790</b>	<b>37,462</b>
<b>Venezuela .....</b>	<b>75,513</b>	<b>56,362</b>	<b>60,389</b>
<b>Other Countries<sup>2</sup> .....</b>	<b>3,500</b>	<b>3,000</b>	<b>3,000</b>
<b>Grand Total (Round Figures) .....</b>	<b>10,047,000</b>	<b>14,174,991</b>	<b>15,262,033</b>

<sup>1</sup>Exports.

<sup>2</sup>Estimated.

<sup>3</sup>Includes an estimated 100,000 ct. for State Mines of Namaqualand.

<sup>4</sup>Revised figure.

**South Africa.**—In 1950, production in the Union of South Africa and South West Africa was as follows:

	Carats	£	Average price	
			s.	d.
Mine production .....	1,516,194	7,906,378	104	4
Uncontrolled alluvial production .....	91,666	893,643	195	0
Namaqualand* .....	40,008	345,386	172	8

South-West Africa .....	1,647,868	9,145,407	111	0
	488,422	6,542,664	267	11

\*Does not include an estimated 100,000 ct. from the State Mines of Namaqualand.

**De Beers Group of Mines.**—Of the total 1950 production of the Union of South Africa, production from the De Beers group of mines was as follows:

Mine	Carats	£	Average price	
			s.	d.
Wesselton .....	341,622	1,869,224	109	5
Dutoitspan .....	302,004	3,293,296	218	1
Bultfontein .....	2,712	13,430	99	1
Jagersfontein .....	120,652	842,935	139	9
Premier .....	690,331	1,460,460	42	4
Kimberley Mine Floors .....	14,719	73,766	100	3
De Beers Mine .....	30,052	219,118	145	10

Wesselton, Dutoitspan and Jagersfontein Mines were in full production throughout the year on a single shift basis. Development work only was carried out at Bultfontein Mine. The alluvial deposits at Kleinzee, Namaqualand, were worked throughout the year.

The use of longhole rotary and extension steel drilling has led to a modification of the chambering system, resulting in reduced costs, particularly in the Dutoitspan Mine.

A ten-ton per hour heavy media pilot plant was operated during the year on run-of-mine ground from Dutoitspan and Wesselton Mines. Results obtained were not satisfactory because of the high slime content of the ground. However, the pilot plant gave successful results when used on the washing plant concentrates.

Systematic sampling of all old tailings dumps was commenced and it is expected that some of the tailings in Kimberley might be profitably worked.

Work was commenced at Koffiefontein, De Beers and Kamfersdam Mines, with the object of sampling these mines at depth.

A portable crushing and washing plant was installed on De Beers Floors to treat old dumps of "hard blue." From May to December, 67,939 loads of ground were washed, which yielded 25,846 ct. Similar operations were carried out on the Kimberley Floors, in which 111,570 loads were treated, yielding 14,719 ct. of diamond.

**Premier (Transvaal) Diamond Mining Co., Ltd.**—During 1950, production by this company totalled 690,330 ct., of which 21,098 ct. were recovered in the pilot plant that was closed down in February when the main plant went into operation. The new plant operated successfully, and was expected to reach its planned capacity of 16,000 loads per day by March, 1951. Arrangements have been made for experimental treatment of old tailings, which bulk sampling has indicated contain an average of 12 ct. per 100 loads.

**The Consolidated Diamond Mines of South West Africa, Ltd.**—Operations by this subsidiary of De Beers Consolidated Mines, Ltd., averaged 31,466 ct. per month in 1950, as against 20,318 ct. per month in 1949. The average size per stone increased from 1.07 ct. to 1.26 ct. Prospecting continued throughout the year on an extensive scale and revealed large payable deposits at Area "U," 10 miles north of Area "G" and Area "M," 20 miles north of Area "G." A plant has been ordered to work these new areas. A heavy media separation plant is being installed at Area "G" and all gravels from Areas "U" and "M" will be transported to this plant for treatment. Electrostatic separation and the recovery of diamonds by a belt grease table will be included in the plant.

**Other Pipe Mines.**—In 1950, only two mines outside of the De Beers group showed results of any importance, their production being as follows:

Mine	Carats	£	Average price	
			s.	d.
Leicester Mine.....	3,207	35,417	220	11
Star Mine.....	9,453	94,300	199	6

The alluvial diamond diggings of South Africa are reserved as an individual occupation. Legislation defines the size and number of claims which may be exploited by a single person. The diggings are now, and have been for a number of years, in a depressed condition, due to the exhaustion of many of the better diggings and lack of suitable new ground to occupy the diggers.

In July, the De Beers' farm, Nooitgedacht, was extended to diggers, when a further 250 morgen of virgin land was made available, with the expectation that some good finds will be made.

Sterkfontein, near Lichtenburg, proclaimed in December, 1949, proved a failure. A portion of the farm Grootdoorn, Bloemhof, 63 morgen, was proclaimed during 1950 and proved reasonably satisfactory.

Total uncontrolled alluvial production in 1950 from the Union of South Africa was 91,666 ct., valued at £893,643, an average price of £195 per carat.

Production was divided as follows:

Area	Carats	£	Average price	
			s.	d.
Cape Province.....	31,646	368,870	233	2
Transvaal.....	59,666	520,613	174	6
Orange Free State.....	354	4,160	237	9

Of the above, the most important producers were:

Cape Province	Carats	£
Barkly West.....	20,083	228,344
Kimberley.....	8,992	96,532
Transvaal		
Lichtenburg.....	29,515	311,766
Rustenburg.....	19,747	50,137

In the Kimberley area, Nooitgedacht produced 6,980 ct. valued at £65,478.

Reported production figures from Namaqualand were 40,008 ct., valued at £345,386, a decrease of about 60,000 ct. from 1949. Figures for the production from the State diggings were not made public, but are estimated at 100,000 ct.

**South West Africa.**—The alluvial diamondiferous deposits of South West Africa extend from the mouth of the Orange River north for 300 miles to Conception Bay. The Consolidated Diamond Mines of South West Africa, Ltd., holds the diamond rights to this area under a concession extending to 1991. In 1950, Area "G," Bogenfels, and Elizabeth Bay produced 391,788 ct., valued at £624,672, as compared with 243,818 ct. in 1949. The balance of the total production produced by independent sources, was 96,634 ct., valued at £295,882.

**Belgian Congo.**—The Belgian Congo continues to be the world's largest producer of diamonds in terms of quantity, but is second to South Africa in terms of value. According to the Colonial Statistical Bureau, diamond production in 1950 consisted of industrials 9,604,128 ct., gem 543,343 ct., or approximately 5.5 per cent gem, 94.5 per cent industrial. This is somewhat lower than the 98 per cent industrial generally attributed to Belgian Congo production. The Belgian Congo produces about three-fourths of the world's supply of crushing board.

The breakdown of production for 1950 into companies and values is given below:

	Carats	Value £
Forminière.....	361,166	464,000
Consortium E.K.L.....	182,177	234,000
Bécéka.....	9,604,128	2,607,000
	10,147,471	£3,305,000

Principal production was by the Société Minière du Bécéka. Production by this company is from the Lubilash Sector, where there are ten workings. Production has been helped by a double washing plant of high capacity and is achieved by treatment of approximately 1,000,000 cu. metres of gravel. The company's programme aims at a more extensive mechanization of their workings in order to increase production. Installation of new machinery was expected to be completed by the end of 1951, to coincide with the completion of a new hydroelectric plant.

**Sierra Leone.**—Total production to December 31, 1950, has been approximately 10,483,000 ct. The Sierra Leone Selection Trust, Ltd., a subsidiary of Consolidated African Selection Trust, Ltd., was the sole exploiter in the colony. Total production for the year 1950 was 655,474 ct., of which 34 per cent were gem quality and 66 per cent were industrial.

**French Equatorial Africa.**—The principal production comes from the Carnat-Berberati-Nola region in the Haute Sangha. The principal operating companies are the Compagnie Minière de l'Oubanghi Oriental (C.M.O.O.), and the Compagnie Equatoriale des Mines. A special advance of funds by the Economic Co-operation Administration to C.M.O.O. is to be repaid in industrial diamonds for the U.S. stockpile. Funds are also loaned to the Société des Recherches et de l'Exploitation Diamantifère (SOREDIA) and the Compagnie Diamantifère et Aurifère de la Haute Sangha, to be used chiefly in exploration work.

**French West Africa.**—The principal diamond deposits in French West Africa, which are all alluvial, are in Haute-Guinée, midway between Beyla and Kisdougou. The deposits are worked by open pit methods, the gravel being taken to the washing plant, where the concentrates are sorted by hand. Total production since the start of operations in 1934 up to 1950 has been approximately 880,000 ct.

In French West Africa total production for the year 1950 by interests of the Consolidated African Selection Trust, Ltd., was 71,557, of which approximately 7 per cent was gem goods and 93 per cent industrial.

**Gold Coast.**—Production comes from alluvial deposits worked by European companies in the Birim River Valley, near Kade, Oda, and Akwatia, and by Africans near the Bonsa River, south-west of Tarkwa. The Birim diamond field is responsible for nearly 95 per cent of the Gold Coast production. A new find midway between Takoradi and Obusai was reported during 1950. Total production from the Birim region up to 1945 has been over 19,000,000 ct., of which the largest stone ever found weighed only 4½ ct.

Official total production figures for the Gold Coast for 1950 are not available, but output is estimated to have been approximately 950,000 ct.

**Portuguese West Africa (Angola).**—Production by the Companhia de Diamantes de Angola (Diamag) in 1950 amounted to 538,866.56 ct., compared with 769,980.75 ct. in 1949. The proportion of gem stones increased slightly from 56 per cent to 57 per cent.

**Tanganyika.**—All production continues to be from alluvial material. Williamson Diamonds, Ltd., is the largest producer, followed by Alamasí, Ltd. The Premier Mine (Estate of J. H. Stanley-White, deceased) was purchased by Williamson Diamonds, Ltd., in June, 1948, and there are, therefore, now only two producers in the field.

In the arrangement completed between producers and the Diamond Corporation, Ltd., in January 1, 1947 (to run for five years), the Diamond Corporation agreed to purchase diamonds each year up to 10 per cent of the total net sales to the market in such year by the Diamond Trading Co. and associated companies. The following quota was allotted between the producers and the Diamond Corporation: Williamson Diamonds, Ltd., 9.172 per cent; Estate of J. H. Stanley-White, 0.136 per cent. In the case of Alamasí, Ltd., the agreement was to purchase up to 50,000 ct. per year.

Exports for the year were 70,597 ct., valued at £746,369.

**Brazil.**—No reliable diamond production figures are available for Brazil. Exports in 1949 were reported to be 51,945 ct.

**British Guiana.**—Production in British Guiana comes chiefly from the Mazaruni district, followed in importance by the Potaro, the Rupununi and the North West districts. The Mazaruni River and its tributaries are estimated to contribute about 75 per cent of the total production every year. New investigations of the Kurupung and Meamu diamond fields were carried out by the Geological Survey of the Colony and it was estimated that there exists 18,000,000 cu. yd. of gravel of uncertain grade.

The British Guiana Diamond Mining Corporation, Ltd., was organized to work alluvial deposits on the Meamu and upper Mazaruni Rivers. A small pilot plant which has been in operation since 1947 has indicated values better than 1/10 ct. per cu. yd. Plans by this company call for a dredge with 750,000 cu. yd. capacity per year.

The Echilebar Development Co. was formed to dredge the Echilebar tributary to the Ireng River, but no activity by this company has been reported. New finds have been reported along the Ireng River, along the Brazilian border, but this area is very remote and lends itself to illicit mining.

Exports in 1948 amounted to 33,959 ct., valued at B.G.\$1,325,026; in 1949, 34,375 ct. valued at B.G.\$1,189,185, and in 1950, 37,033.7 ct. valued at B.G.\$1,363,378. Exports are principally to the U.K.

**Venezuela.**—Venezuela in the past 30 years has produced 536,000 ct. of diamonds, chiefly from four alluvial districts.

The Compania Venezolana del Diamante, a government financed organization operating in the Surukun Valley, has completed the installation of a gravity washing plant and began operations in 1950. Production in November was 819½ ct. Discovery of diamonds in the Uriman region attracted a large number of diamond washers to the region. However, the Uriman is a part of the National Reserve for purposes of diamond exploration and exploitation, and the Government forced the evacuation of miners from the area. A production of about 20,000 ct. was reported from these short-lived operations. Official production from the combined Uriman and San Pedro El Pao regions was 15,233.64 carats.

## REVIEWS

**The Formation of Mineral Deposits.**—By Alan M. Bateman. 1951. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd. Pp. xi + 371. Numerous illustrations in the text. 5½ x 9½ in. Price 44s.

This book by the Silliman Professor of Geology, Yale University, and Editor of *Economic Geology*, contains a co-ordinated and integrated treatment, in simple language, of the origin of mineral deposits. It conveys fundamental information on the formation and occurrence of the deposits that yield our mineral wealth, and since metals and minerals are the basis of modern industrial development, *The Formation of Mineral Deposits* meets the long-felt need for a non-technical book on this subject. Indeed, the reader does not require any knowledge of mineralogy—technical words are kept to a minimum and those terms that are used are explained in a brief glossary.

Descriptions of individual deposits and of the many industrial uses of the various metals and minerals, are omitted, as such information may be found elsewhere, e.g., in the second edition of the author's *Economic Mineral Deposits* (1950) (see *The Mining Journal*, April 27, 1951). Tabular and statistical matter are also omitted, and there is no treatment of individual mineral commodities as such. Yet in spite of the inevitable abbreviation and simplicity, the quality of treatment of the content stands unimpaired. There is no doubt that this new book forms a valuable source of information for the general reader.

**South African Scenery. A Textbook of Geomorphology.**—By Lester C. King. Second Edition Revised, 1951. Edinburgh: Oliver & Boyd, Ltd. Pp. xxxi + 379; Figs. 79; Plates 267 and coloured erosion map. 5½ in. x 9 in. Price 45s.

The prediction made in the first edition of this valuable addition to geomorphological literature that progress in the study of African geomorphology should be rapid in the next few years has been amply verified. Despite the war, many notable contributions have been made, and within the scope of this work, several new interpretations have to be considered. A great part of the book has, indeed, been re-written. Inevitably, with increase of knowledge, the volume has become a little larger, and advantage has been taken of the opportunity to substitute or add a few photographs.

**The Dynamics of Faulting and Dyke Formation With Applications to Britain.**—By E. M. Anderson. Second Edition, 1951, Edinburgh: Oliver & Boyd, Ltd. Pp. x + 206. Figs. 39. 5½ x 9 in. Price 22s. 6d.

The theory of faulting which has been developed in this book is based upon Navier's principle. A short historical survey is followed by chapters dealing with stress, the different types of fault and the dynamics of dyke formation. Examples follow illustrating dykes and normal faults in Britain, with a larger section on thrust and wrench faults. A short chapter on earthquakes is followed by the crustal dynamic problems and finally, conclusions stated. A full bibliography is given with each chapter.

**Near Ripe Minerals.**—The Central Board have issued a pamphlet—S.I.A. (*Minerals*)—on near ripe minerals with the object of explaining briefly the Mineral Development Charge Set-off Regulations (S.I.1951, No. 2156). The Regulations have been approved by both Houses of Parliament and came into operation on December 4, 1951. Copies of the pamphlet may be obtained on application from any of the Board's offices.

## MACHINERY AND EQUIPMENT

### The Economic Limit of Lightweight Drilling Equipment

U.S. investigations on the use of lightweight drills are referred to in a paper presented at the American Mining Congress by Mr. A. J. Zinkl, Assistant Superintendent, Iron King Mine, Shattuck-Denn Mining Co., Humboldt, Ariz.

The author refers to the fact that the complete conversion to drilling with tungsten, carbide bits and alloy drill steel, after two years of test work, at the Iron King mine led to further test work to determine the size of machine which would be most economical to use with these bits. He adds that the possibility of replacing worn stoppers and drifters with new lightweight drills was worth investigating and that the problem of how small a drill could be used in Iron King ore resulted in 12 separate tests.

For years the mine has used the 116 lb. stoper and the 3½ in. power-fed drifter. If smaller equipment would drill as well as these drills, then the initial and maintenance cost of these smaller drills would help reduce drilling costs.

To conduct these tests, the company purchased one 98 lb. stoper and one 77 lb. stoper, as well as one 3 in. power-fed drifter. To carry the test one step farther it decided to try the 1½ in. bit against its present 1¼ in. bit, and to try ¾ in. steel against its present 1 in. steel.

By combining these various items, the company was able to conduct these 12 tests. Three of the tests were quickly eliminated on the basis of too little hole clearance. This occurred when the 1 in. steel was used with the 1½ in. bits. Three more tests were concluded when the ¾ in. steel was used with 1½ in. bits. This pairing proved too severe on bit shirt life and steel thread life.

After approximately 12,000 ft. of drilling with the destruction of 105 tungsten carbide bits, the company compared the cost figures on the remaining tests. These results were also compared with the costs of the former practice of drilling with steel bits. The analysis of the costs showed that the 98 lb. stoper with the ¾ in. drill steel and the 1 in. bit was appreciably better than any of the other results. The results obtained with the smallest stoper proved to be disappointing as it cost more to get a ton of ore with this stoper than it does with the company's present 116 lb. stoper, using the larger steel and bits.

However, all the tests with the tungsten carbide bits showed considerably better results as compared with the detachable steel bits and Mr. Zinkl points out that this cost reduction is all in the labour saved in drilling in the stopes, as the cost of the bits themselves is higher per ton than it was with steel bits. While conducting these tests, they had the opportunity to review their original test work as well as the performance of the bits for the past three years. This review indicates a definite trend that a better tungsten carbide bit is on the market to-day than was put out originally. The test work described resulted in the company's decision to purchase the 98 lb. stoper when they replace their worn 116 lb. machines and to convert steel and bits to the smaller sizes.

### Bellis and Morcom Compressor at Stilfontein

In the December quarterly report from Stilfontein Gold Mining, which is situated in the Klerksdorp District, Transvaal (south-west of the West Wits line), it is stated that a second 50-drill Bellis & Morcom compressor was put into commission and that the supply of compressed air is adequate for present requirements.

### New Nife Mine Shaft Signalling Battery Units

Two new types of Nife-Neverfayle self-contained, steel-clad battery units for use with mine shaft signalling equipment have just been developed by Nife Batteries, Redditch, Worcs. Based on the proved design of the company's tripping units, which are used in great numbers throughout the world for the protection of high-tension switchgear, the unit offers a reliable source of D.C. current for shaft signalling under both normal and emergency conditions. Units operating on either a single or a dual battery system can be supplied.

The control gear is housed in the upper section of the floor mounted steel cubicle with the battery or batteries in the lower section. A full wave, bridge connected, selenium rectifier is employed with a transformer of the double wound, vacuum impregnated type with tapped primary and earth screen between the primary and secondary windings. Complete control is afforded by a 4-position master switch, mechanical and electrical interlocks preventing incorrect switching by unauthorized persons.

With the single battery system the shaft signalling load is connected directly to the battery and is compensated by a low rate charge adjusted to maintain the battery at full capacity. Provision has been made for high rate charging in the event of a prolonged interruption in the mains supply or maladjustment of the low charge rate. The state of charge can be determined at any time by depressing a test switch and noting the reading on a moving-coil ammeter marked with a red danger line.

If a spare battery is preferred to provide a reserve supply against any contingency, then a unit operating on the dual battery system can be supplied, the signalling load being connected directly to one of the batteries while the other remains on open circuit or on charge. The 4-position rotary switch is again the only control necessary. In position 1, battery No. 1 is on discharge and No. 2 on open circuit; position 2, battery No. 1 is on discharge and No. 2 on charge; position 3, battery No. 2 on discharge and No. 1 on open circuit, and position 4, battery No. 2 on discharge and No. 1 on charge. Indicator lamps are provided to show which particular battery is on charge at any given moment.

The batteries associated with the new unit, the Nife nickel cadmium type, are of all-steel construction and virtually indestructible, both mechanically or electrically. The chemical reaction is completely reversible and the manufacturers state that there are no losses when standing idle on open circuit. They add that many batteries of this type are in regular use with upwards of twenty years of trouble-free service.

### Tornado T Type Dust Units

We have just received from Keith Blackman Ltd., Mill Mead Road, London, N.17, the third edition of their Publication No. T.1, which has been completely revised, brought up-to-date, and issued as Publication No. 16. It contains 24 pages devoted to the complete range of the company's well-known Tornado type "T" dust collecting units (which now comprise five units of varying capacities, as against two units in the previous issue). In addition, it gives specifications; dimension drawings; typical arrangements, performance data, and instructions for ordering. The publication is, in fact, more than twice the size of the first and second editions. Interested readers may apply to the Publicity Department, at the above address, for a copy.

## METALS, MINERALS AND ALLOYS

Reports from Washington are giving what is purported to be the details of a new agreement between Mr. Truman and Mr. Churchill. These reports must be treated with a certain degree of reserve until the official announcement confirms or disproves them. It is believed that the U.S. will purchase 20,000 tons of tin at £944 per ton and that the United Kingdom will receive 1,000,000 tons of steel or steel-making material other than ore and that the U.S. will borrow another 15,000 tonnes of aluminium. If these reports are near the truth—and American guesses usually qualify for that description—the agreement can be very important, if only because the agreement can be renewed when it runs out and because it could form the basis for further commodity pacts.

An assessment of the prospects of the supply of scarce metals overtaking supply in 1952 estimates that free world supplies of sulphur, copper, nickel, cobalt, tungsten and molybdenum will not be sufficient to meet demand. This conclusion, reached by the International Materials Conference, takes into account optimistic assumptions of future production increases, and allows for the increased application of conservation practices.

Reports from Switzerland state that an international metal exchange is being formed in Zurich under U.S.-European direction. This exchange will deal in metals and other raw materials only for Swiss francs or U.S. dollars.

**COPPER.**—Preliminary world production figures of refined copper for 1951 are now available from the Copper Institute. These show U.S. production as 1,199,785 s.tons. Production for the rest of the world, exclusive of U.S.S.R., Japan, Australia, Yugoslavia and Sweden come to 1,225,018 s.tons. Production in Japan in 1950 was around 43,000 s.tons, in Australia about 16,000 and in Sweden about the same, which suggests a world copper production for 1951 of about 2,500,000 s.tons exclusive of U.S.S.R. and Yugoslavia.

United States stocks at the end of 1951 showed at 71,528 s.tons, a marked improvement over the corresponding figure a year ago which stood at 49,040 s.tons. Stocks in the rest of the world are also estimated to have increased.

Mr. Cornelius F. Kelley, chairman of Anaconda, asserts that responsible mobilization officials have conducted a systematic campaign that practically amounted to propaganda urging the substitution of aluminium for copper. In his view it is apparent that the copper supply will begin to improve materially during the latter half of 1952. This improvement will come from the operations commencing in the spring at the Greater Butte Project and the new sulphide plant at Chuquibambilla, Chile. These operations are expected to add about 95,000 tons of copper per year. Anaconda's Yerington project should be producing copper by the end of 1953 at the annual rate of 30,000 tons.

In the Northern Territory of Australia, 20 copper mines are lying idle, according to reports from Darwin, because of the lack of a smelter to treat the ore. These mines, it is reported, are capable of producing thousands of tons of the metal. Some of these mines have assayed 30 per cent copper, and one mine is stated to be mining wolfram and discarding "rich" copper lode.

U.K. stocks, including floats, at the beginning of December, are computed as 154,062 tons as compared with 152,435 tons a month earlier. November consumption was 50,295 tons of primary and secondary material, making the total for the eleven months 511,107 tons as compared with 481,989 tons a year ago. U.K. imports in November were 30,270 tons—electro 18,069, and blister 12,201 tons.

**LEAD.**—The world free market for lead is still weakening. Whereas many producers have refused since last October to sell lead to the U.S. at the ceiling price of 19c. per lb., there are signs that they are now willing to sell lead at this price for shipment during the first half of the present year. The chief sellers of Mexican lead are, however, looking to the Continent of Europe for buyers rather than relying on the United States. The Gulf f.a.s. market price has been dropping and it has only to shed another cent or less to enable lead to be shipped

to the United States at the ceiling price. Naturally, the consumers are enjoying this turn-round, and they are now the reluctant parties to any deal. This attitude is causing further weakening in the price and brings nearer the possibility of offers of foreign lead. If this should happen, there is reckoned to be a good chance that domestic allocations in the U.S. may be ended. A committee of U.S. lead consumers is taking steps to ask Congress to suspend the lead import duty.

U.S. lead imports during 1951 slumped to about 225,000 tons, as compared with imports of 540,000 tons in the previous year.

U.K. imports in November were 21,900 tons, about half from Australia. U.K. stocks and floats increased substantially in November and at the beginning of December stood at 99,605 tons compared with 87,988 tons a month earlier. November consumption was 28,674 tons making 318,546 tons for the eleven months of last year.

**TIN.**—Even assuming that the reports of the Anglo-American deal are justified, the implications are not clear. The method of quoting the agreed price of £944 is not stated; although the behaviour of the market suggests that the consensus of opinion assumes the basis to be f.o.b. Unconfirmed reports from Washington indicate that the British Government will buy the metal in the free market. This would mean that the British Government would pay the difference or pocket the profit between the market price and £944, and that at current prices it faces a substantial loss. However, all this is conjecture until official release of the details.

It is now reported that President Truman has asked Mr. Symington to stay on temporarily as Administrator of the Reconstruction Finance Corporation while the Senate considers the nomination of Mr. Harry McDonald to succeed him.

U.K. imports in November were 3,489 tons of concentrates—Bolivia 1,931 tons; Nigeria 1,307 tons.

**ZINC.**—The report of the American Zinc Institute for December has caused a certain amount of turning back of the pages. Smelter production at 81,769 s.tons was the highest since March, 1944, making a total for the year of 931,833 tons compared with 910,354 tons in 1950. Shipments on export and drawback were the highest since June, 1949; the December figures were 8,813 tons. Unfilled orders were cut by 16,800 tons to 50,509 tons, the smallest backlog for nearly two years.

The U.S. zinc export price has fallen steeply. Prime Western zinc was quoted at 23-24c. f.a.s. per lb., against 26-26½c. previously.

U.K. imports in November were 8,982 tons principally from Canada. Concentrate imports were 18,391 tons. U.K. stocks on December 1 including floats were 52,206 tons compared with 50,628 tons a month earlier. Consumption in November was 24,994 tons making 259,725 tons for the eleven months (205,373 a year ago).

**ALUMINIUM.**—There is plenty of evidence that the U.S. aluminium industry is not able to keep pace with American defence demands. Mr. C. E. Wilson, defence mobilizer, told the President last week that a total of 10,000 s.tons of aluminium was being withdrawn from the stockpile. The trouble is that supplies of fluorspar and sulphuric acid might be so limited in 1952 that the production of aluminium might be affected. There were also power losses in the Pacific North West area which were restricting production.

Later in the week, officials of N.P.A. said that the backlog of aluminium metal and products threatened to reach 95,000 s.tons by the end of June. To avert this huge deficit, it was planned to keep allocations low enough to keep the backlog down to 35,000 tons. Against these figures, the borrowing of 25,000 tonnes (10,000 tons under the plan announced last November and 15,000 tons now rumoured) seems to be a reasonable amount.

**COBALT.**—The Canadian Minister of Defence Production has announced higher prices for cobalt ores and concentrates. This increase was intended to provide producers with an incentive to mine cobalt in spite of rising costs. Ore or concentrates containing between 7 per cent and 7.99 per cent

would receive a premium price of \$1.20; higher grades would command better premiums up to 1½ per cent ore which would receive \$2.00.

**QUICKSILVER.**—The recent slide in the price of quicksilver has continued. The U.S. quotation has recently been \$209-\$212 per flask, a decline of \$3.

**SULPHUR.**—The Defence Production Administration wants to add another 38 per cent to the 1950 sulphur production in the U.S. by 1955. This would bring output up to 8,400,000 tons. Already half of the expansion is in sight, and it is hoped to be able to obtain the remainder during the next three or four years.

**TUNGSTEN.**—The opposition of the tungsten producing countries to the I.M.C. four-year plan has been so intense that the tungsten-molybdenum sub-committee has formally withdrawn its proposals. Further efforts are to be made to reach agreement, by, so it is reported, reducing the term of an agreement, possibly to two years, and by raising the price above the level of \$6 originally contemplated.

The supply position in the U.K. is slightly easier than for some time, and there is a fair amount of buying passing at 48½s. c.i.f. The U.S. Government buying price eased yesterday to \$60 per s.ton unit.

**URANIUM.**—A message from South Australia reports the Prime Minister, Mr. Robert Menzies, as saying that uranium deposits are to be developed at Radium Hill. This is in the security area in the north-east of the State. Only the briefest details were being released because of security considerations.

**GOLD.**—The production of gold in the Transvaal and the Orange Free State in December totalled 948,947 f.o.z., as compared with 964,818 f.o.z. in November.

**PLATINUM.**—The issue of a price regulation governing the price of platinum is expected to be issued in the United States in the course of the next few days. This regulation, already expected for a long time, will replace the present system of individual price ceilings, ranging from \$90 to \$120 per f.o.z., by a flat nation-wide price ceiling.

## The London Metal Market

(From Our Metal Exchange Correspondent)

At the beginning of the week despatches from Washington gave a few bare particulars of an agreement concluded between the British and American governments, part of which was a purchase by the latter of 20,000 tons of tin during 1952 at a price of 118c. per lb. This information apparently became available through a "news leak" as the official announcement was only to be made some days later. As the general assumption of the market was that the price mentioned was f.o.b. Singapore and that the tin was for the U.S. industry, the price in London remained firm and the turnovers increased considerably, but pending a more detailed study of the information available no one is prepared to commit themselves as to the likely course of the market during the next few weeks.

The picture of the free markets in other metals has undergone a complete change in recent weeks, and with more metal on offer prices have fallen considerably and it is felt that this is the first step towards a more realistic difference between the prices at which a small marginal tonnage changes hands and those at which the bulk of the main metals is traded. Dollar copper is valued at a little below 50c. per lb. c.i.f. Europe, and there is no sterling material available. Zinc with payment in dollars stands around 26c. per lb. c.i.f., and with payment in sterling at something under £250 per ton. The sterling price for lead is in the region of £175 per ton, c.i.f. with no buyers willing to pay in dollars.

On Thursday the official close on the tin market was: Settlement price £968 10s., Cash Buyers £968, Sellers £969; Three months' Buyers £968, Sellers £968 10s. In the afternoon the market was slightly easier. Turnover for the day was 130 tons. Approximate turnover for the week was 1,110 tons.

The Eastern price on Thursday morning was equivalent to £971 17s. 6d. per ton, c.i.f. Europe.

## Iron and Steel

The outcome of the Truman-Churchill talks is that Britain is to receive 1,000,000 tons of American steel this year. More steel may also come in from the Continent and the industry hopes to increase home production from 15,640,000 tons last year to about 16,000,000 tons in 1952.

The Minister of Supply has been at pains to warn steel users engaged in "non-essential" production that they must not expect any increase in their allocations at least until the second half of the year. In the first place the first of the American shipments are not likely to arrive for a few months and at least half the tonnage will be required for rearmament work. Most of the remainder will go to the production of manufactures for export and for the replenishment of stocks which have been seriously depleted. Thus it would appear that the American help will not avert a severe squeeze during the next few months. Thereafter the worst of our troubles may be over.

A statement by the British Iron & Steel Federation fully confirms the thesis that last year's failure to reach the target of 16,000,000 ingot tons was entirely due to shortage of materials.

Imports of scrap (550,000 tons) were very close to the estimate but outside the steel works where an extra 325,000 tons of scrap were produced the home scrap drive was a failure and even after the withdrawal of 350,000 tons from stock, the total consumption was reduced by over 1,000,000 tons.

Similarly, shortage of coke restricted the output of pig iron and finally there was a diversion of pig iron to iron foundry.

### JANUARY 17 PRICES

#### COPPER

Electrolytic ... .. £227 0 0 d/d

#### TIN

(See our London Metal Exchange report for Thursday's prices)

#### LEAD

Soft foreign, duty paid ... .. £175 0 0 d/d  
Soft empire, including secondary lead ... .. £175 0 0 d/d  
English lead ... .. £176 10 0 d/d

#### ZINC

G.O.B. spelter, foreign, duty paid ... .. £190 0 0 d/d  
G.O.B. spelter, domestic ... .. £190 0 0 d/d  
Electrolytic and refined zinc ... .. £194 0 0 d/d

#### ANTIMONY

English (99%) delivered,  
10 cwt. and over ... .. £365 per ton  
Crude (70%) ... .. £290 per ton  
Ore (60% basis) ... .. 45/50s. nom. per unit, c.i.f.

#### NICKEL

99.5% (home trade) ... .. £454 per ton

#### OTHER METALS

Aluminium, £148 per ton. Palladium, £8 10s. oz.  
Bismuth, 28s. lb. Platinum (scrap), £33.  
Cadmium, 18s. 9d. lb. Platinum, £27 33 5s. nom.  
Chromium, 6s. 3d. lb. Rhodium, £45 oz.  
Cobalt, 17s. 6d. lb. Ruthenium, £30 oz.  
Gold, 248s. f.o.z. Quicksilver, £73 10s./£74  
Iridium, £65 oz. nom. ex-warehouse.  
Magnesium, 1s. 6d. + 2s. lb. Selenium, 25s. nom. per lb.  
according to quantity. Silver (bar), 77d. f.o.z. spot  
Osmiridium, £35 oz. nom. and forward.  
Osmium, £70 oz. nom. Tellurium, 19s. lb.

#### ORES, ALLOYS, ETC.

Bismuth ... .. 30% 12s. 9d. lb. c.i.f.  
... .. 20% 10s. 3d. lb. c.i.f.

#### Chrome Ore—

Rhodesian Metallurgical (lumpy) £13 per ton c.i.f.  
" " (concentrates) £13 per ton c.i.f.  
" " Refractory £12 12s. per ton c.i.f.  
Baluchistan Metallurgical ... .. £13 18s. 6d. per ton c.i.f.  
Magnesite, ground calcined ... .. £26 - £27 d/d  
Magnesite, Raw ... .. £10 - £11 d/d  
Molybdenite (85% basis) ... .. 103s. 1½d. per unit c.i.f.  
Wolfram (65%), U.K. ... .. 485s. nom. c.i.f.  
Tungsten Metal Powder ... .. 35s. nom. per lb. (home)  
(for steel manufacture)  
Ferro-tungsten ... .. 33s. nom. per lb. (home)  
Carbide, 4-cwt. lots ... .. £30 3s. 9d. d/d per ton  
Ferro-manganese, home ... .. £41 8s. 2d. per ton  
Brass Wire ... .. 2s. 7½d. per lb. basis.  
Brass Tubes, solid drawn ... .. 2s. 1d. per lb. basis.

# THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets this week remained undecided. It is thought that some hard bargaining may be going on at the Commonwealth Conference now in progress, and that the main difficulty will lie in ironing out the differences between net dollar earners and net dollar spenders. Foremost among the latter is, of course, the U.K. Gilt-edged showed little change. What movement there was tended to be away from undated and long-dated stocks towards medium term securities, many of which now stand at substantial discounts.

Industrials were uneasy owing to doubts over increased costs, falling demand and shortage of raw materials for certain industries. A spate of large capital issues hastened the decline.

Gold shares were no exception to the general rule. The public are still taking little interest in this market and prices again dwindled through lack of attention. There were, however, one or two bright spots among Kaffirs. Stiffontein figures for the December quarter show continued payability of nearly 100 per cent while value of reef sampled has recovered from 264 in.-dwt. in September to 326 in.-dwt. Lydenberg Estates jumped from interest displayed in the prospects of the company's asbestos holdings. West Rand Consols and West Driefontein both improved following bargain hunting in the Cape. Informed opinion in Johannesburg expects some good developments from the Far West Rand during the coming year. The West Driefontein mill is expected to be officially started by Mr. Robert Annan in a fortnight's time.

Although for some time it has been apparent that diamond sales figures for the past year could be a record the total, £65,100,000, is a truly formidable amount. Sales of industrial stones have again gone well ahead. While much of this demand is for hoarding and stockpiling purposes, it is difficult to foresee any immediate setback. Such a movement is only likely to develop if world peace seemed assured. Anticipating improved dividends, all leading issues in the market improved. For some years the directors of De Beers have been taking

advantage of this prosperity by building up reserves and widening their interests outside diamond mining.

The news that the Brazilian Government has passed a decree limiting the remittances made by foreign companies operating in Brazil, caused a fall of 3s. in St. John del Rey shares. It is understood that the United States, United Kingdom and other interested countries are making the strongest possible protests.

Tin and copper shares were by far the brightest sections in the whole market, although even here caution was noticeably present. Coppers were buoyant in anticipation of full details of the Anglo-American raw materials agreement. The United States are still reported to be very short of the metal.

The announcement of the "swop" of steel by the U.S. against aluminium, copper and tin took markets some little time to digest. The tin market has on the whole accepted this favourably. At least America is in the market again, and this will increase the total consumption. It is assumed that the British Government will stand any loss between the contracted price of £944 per ton and whatever it is necessary to pay for the metal which is currently standing above this level. The alternative of forcing the companies to sell a proportion of their output at a lower figure could hardly be regarded as either satisfactory or honest.

Eastern tin shares improved all along the line, some of the more popular counters going ahead sharply. Nigerians, which have shown little change for some time, also attracted buyers. Among these issues Jantar Nigeria were prominent following the announcement that they have contracted to sell all their columbite production at a higher price than last year.

Wankie Colliery recovered from last week's low level. Cheap buyers found the market short of stock. The recent fall is understood to have been partially caused by the appearance of a large seller. Another factor is that labour conditions in Africa are to-day highly competitive and lack of skilled operators has been holding up mechanization.

FINANCE	Price	+ or -	Price	+ or -	MISCELLANEOUS GOLD	Price	+ or -	TIN (Nigerian and	Price	+ or -
	Jan. 16	on week	Jan. 16	on week	(contd)	Jan. 16	on week	Miscellaneous)	Jan. 16	on week
African & European	248		Alpha F.S.A.	8/9	G.F. Rhodesian	6/9	-3d	Amalgamated Tin	11/3	+1/-
Anglo American Corp.	7 1/2		Blankport	19 1/4	London & Rhodesian	5/8	-1 1/2d	Berkat Tin	2/6	-1/-
Anglo-French	21/3		Central Mining F.S.	4/3	Motapa	2 1/4		Bisichi	4/9	+3d
Anglo Transvaal Consol	35/-	-2/6	Fredries	8/9	Mysore	5/-	-3d	British Tin Inv.	19/6	+9d
Camp Bird	12/6	-4 1/2	Fredries N.	8 1/2	New Guinea	1/6		Ex-Lands Nigeria	6/9	+6d
Central Mining (2 1/2 shrs.)	38/9		Freonies	7 1/2	Nandy Isog.	6/8	-3d	Geevor Tin	16/6	
Consolidated Goldfields	48 1/4		F.S. Geduld	2 1/2	Ooregum	3/-		Gold & Base Metal	4/6	-1 1/2d
Consol. Mines Selection	30 1/2	-7 1/2	Geoffries	21/-	Oroville	13/3		Jantar Nigeria	7/9	+6d
East Rand Consols	3 1/4	-3d	Harmony	23/-	Rhodesian Selection	35/-	-3 1/4	Jos Tin Area	11/3x3d	
General Mining	8 1/2	-1/2	Lydenberg Estates	10/9	St. John d'El Rey	35/-	-2 1/2	Kaduna Prospectors	4/3	+3d
H.E. Prop.	36 1/4	+7 1/2	Middle Wits.	19/9	Zams	42/-		Karduna Syndicate	6/3	+6d
Henderson's Transvaal	13/6	+3d	Ofits	40/-				London Tin	6 1/2	+1 1/2d
Johnnies	3 1/2		President Brand	17/9				Ribon Valley	1 1/4	+3d
Rand Mines	6 1/2	-1/2	President Steyn	15/9				United Tin	3 1/4	+1 1/2d
Rand Selection	41 1/4	-1/3	St. Helena	21/3						
Union Corporation	8 1/2		U.F.S.C. & G.	8/3						
Vereeniging Estates	4 1/2	-1/2	Virginia Deb.	7/3						
Wits	31 1/4		Virginia Ord.	10/6						
West Wits	43/9	+1/3	Welkom	32/6						
			Western Holdings (New)	3						
<b>RAND GOLD</b>								<b>SILVER, LEAD, ZINC</b>		
Blevens	42/-	-1/3	<b>WEST AFRICAN GOLD</b>					Broken Hill South	53/-	-9d
Brakpan	17/9	-9d	Amalgamated Basket	1 1/4				Burma Corporation	4/-	
City Deep	46/3	-2/6	Ariston	6/9				Consol. Zinc	32/-	-1/-
Consol. Main Reef	34	-1/3	Ashanti	25/6				Lake George	23/6	-6d
Crown	3 1/2		Bilant	3 1/4				Mount Isa	44/-	-2/-
Dagaa	3 1/2		Bremang	2 1/4				New Broken Hill	26/9	+3d
Dominion Reefs	2 1/4		G.C. Main Reef	3/6				North Broken Hill	68/3	-1 1/2
Dorefontein	2 1/2	-6d	G.C. Selection Trust	7 1/2				Rhodesian Broken Hill	21 1/2	+1 1/2
Durban Deep	3 1/2	-1/2	Konongo	3 1/4				San Francisco Mines	27	-3/-
E. Dagaa	22/6	-7 1/2	Kwahu	4 1/4				Trepan	3 1/2	
E. Geduld (4 1/2 units)	6 1/4		London & African Mng.	1/9						
E. Rand Props	3 1/2		Lydenburg Deep	1 1/4				<b>MISCELLANEOUS</b>		
Geduld	6 1/2		Marlin	9/9				<b>BASE METALS &amp; COAL</b>		
Grosveld	32/6	-7 1/2	Nanwa	6/-				Amal. Collieries of S.A.	55/-	+1/3
Lithuanian Veld	12/9	-1 1/2	Taqub & Abosso	5/9				Associated Manganese	55/6	
Marievale	21/6		<b>AUSTRALIAN GOLD</b>					Chinese Engineering	4 1/4	
Modderfontein B.	5/6	-9d	Boulder Perseverance	3/-				C.P. Manganese	52/-	-1/3
Modderfontein East	31/3		Gold Mines of Kaloortie	12 1/4				Natal Navigation	47	-1/2
New Kleinfontein	16/9	-3d	Great Boulder Prop.	6/6				Wankie	18 1/2	+2 1/4
New Pioneer	16/-		Lake View and Star	19 1/4				Witbank Colliery	3	-1/2
Randfontein	16/-		Mount Morean	17/6						
Robinson Deep	32/6	-6d	North Kalguri	15/3				<b>CANADIAN MINES</b>		
Rose Deep	6/-	-1 1/2	Paritica	7 1/4				Dome	\$30x0	-8 1/2
Sinmur & Jack	22/-	-4 1/2	Sons of Gwella	8/6				Hudson Bay Mining	\$123	-31
Sprines	22/-		South Kalguri	7/9				International Nickel	\$84	
Suk Nial	14/-	-3d	Western Mining	12 1/2				Mining Corp. of Canada	23 1/2	-3 1/2
Venterspost	22/-		<b>MISCELLANEOUS GOLD</b>					Noranda	\$150	
Westfontein	26/6	-3d	Cam and Moter	36/3				Queomont	68 1/2	+1 1/2
Yoelestrich	6 1/2		Champion Reef	9/-						
West Driefontein	46/3	+1 1/2	Palms Mines	9/6				<b>OIL</b>		
West Rand Consolidated	41/3		Globe & Phoenix	23/6				Anglo-Iranian	5 1/2	-1 1/2
Western Reefs	41/3							Attock	24/6	+1 1/4

## COMPANY NEWS AND VIEWS

### Diamond Sales in 1951 Over £65,000,000

Diamond sales to the value of £65,057,965 were effected through the Central Selling Organization on behalf of South African and other producers during 1951. This record figure was announced by De Beers Consolidated Mines at the beginning of the week and compares with the previous record established last year of £50,967,041.

The following table gives details of gem and industrial sales for each quarter over the past two years:

1950	Gems	Industrials	Total
	£	£	£
March Qtr. ....	10,486,078	2,114,107	12,600,185
June Qtr. ....	6,744,765	2,471,333	9,216,098
Sept. Qtr. ....	10,758,265	2,528,428	13,286,693
Dec. Qtr. ....	10,368,590	5,495,475	15,864,065
Total	38,357,698	12,609,343	50,967,041
1951			
March Qtr. ....	11,296,231	2,887,817	14,184,048
June Qtr. ....	14,190,251	6,221,976	20,412,227
Sept. Qtr. ....	10,476,858	4,621,082	15,097,940
Dec. Qtr. ....	10,817,292	4,546,457	15,363,749
Total	46,780,632	18,277,332	65,057,964

Sales for the first nine months of 1951 having reached £49,694,216 it was obvious that a new record would be established. Nevertheless, it is cause for satisfaction that the latest return for the December quarter showed no lessening of demand for either gems or industrials. Nor does it seem likely that any sharp decline is in sight.

The uneasy international economic and political situation manifests itself in the private hoarding of gems against the rapid erosion in the value of local currencies and the increased demand for industrial stones to implement rearmament programmes. These symptoms are basic to the present prosperity of the diamond industry and show little signs of disappearing. Indeed, it would appear that the demand for industrial diamonds, in any event, will become stronger in the current year.

This is the feeling left after reading the December diamond market report issued by J. K. Smit and Sons which comments on the speculation in industrial diamonds brought about by the greater demand for crushing board for rearmament purposes. This speculation, the report states, is due partly to continued demand from Iron Curtain countries which has become more apparent since the Czechoslovakian Government let it be known that they were in the market for such goods. The result has been the creation of a black market in the stones and it is said that operators behind the Iron Curtain are paying up to 330 per cent over distributors' levels. This fantastic price level compares with an open market price in America of approximately 110 per cent over basic levels and with 185 per cent over these levels on the European open market.

The various holes through which supplies are filtering can only be effectively plugged by the combined efforts of Great Britain and the U.S.A., the report states, and only if this is achieved can the supply of diamond bonded wheels be made available under the two years' delivery date now being quoted in the United States.

Hence, all evidence points to the current year's worry being more concerned with supply than with demand, and that being so, it is hardly likely that the present disagreement between the De Beers selling organization and Dr. Williamson over the disposal of his Tanganyika production will upset the diamond market in their present buoyant state.

### Jos Tin Pays 20 Per Cent

Neither the sharp rise in costs nor the decline by 23 tons to 167 tons in the amount of tin concentrates sold prevented Jos Tin Area (Nigeria) from experiencing an exceptionally good year to July 31 last.

The sharp rise in costs which raised mining expenditure by £12,757 to £57,825 was due to heavier royalty changes and to

increased wages and benefits to native employees. But the larger outgoing payments required to meet these liabilities were more than offset by the advance in the price the company received for the sale of its tin concentrates.

Year to	Tin	Proceeds	Gross	Tax	Net	Divi-	Carry
July 31	Sold	Conc.	Revenue		Profit	dend	Fwd.
	(Tons)	£	£	£	£	%	£
1950	190½	87,783	102,809	27,000	24,191	9.1	15,157
1951	167½	129,859	149,171	48,000	35,042	20	15,587

This is clearly reflected in the profit and loss account where profit, before tax, was shown at £83,042 against £51,191 for the preceding year. As usual the tax man benefited most, his cut of the profits being no less than £48,000, an increase of £21,000.

Nevertheless, profit available for distribution was eminently satisfactory and to the dividend of 15 per cent was added a bonus of 5 per cent making 20 per cent for the year against 9.1 per cent previously.

The chairman, Mr. Stanley A. Williams, once more pointed out that the company's mining areas were largely exhausted and that while output may rise for a month or two the future trend of production would be definitely downwards. Nevertheless, for the first four months of the company's current fiscal year output returns reveal that 58½ tons were produced against 55 tons in the corresponding period of the year under review.

One of the features of the accounts under review was the respectable size of investment income received. Gross receipts from dividend and interest advanced from £14,420 to £18,656 and this improvement went hand in hand with the appreciation in the market value of the company's quoted investments by £70,586 or 31.9 per cent over their book value which, at the date of the latest balance sheet, July 31, 1951, stood at £221,273.

## Company Shorts

**Lake George to Remain in the U.K.**—Not unexpectedly, there was a lengthy discussion at the Lake George Mining Corporation's annual meeting, held earlier this week, on the question of the company transferring its seat of control from this country to Australia.

Sir Godfrey Fell, chairman, in reply to questions about the transfer of control, said that quite apart from the fact that the majority of the shareholders were opposed to a transfer of domicile, the only reason advanced which could be submitted to the Treasury, was that such a move would be to reduce the company's taxation liabilities. This being the case, Sir Godfrey said that he could see no possibility of the application for Treasury permission being successful. Nevertheless, he suggested that if the shareholders still wished to pursue this point, they should form a small committee of two or three, who could meet the board and discuss the matter with them. The board would give such a committee every assistance in its power.

**Harmony to Increase Capital.**—At the first ordinary general meeting of Harmony Gold Mining Co. held on November 2 last, shareholders approved a resolution providing for an increase in the company's capital from £3,000,000 to £3,750,000, in 15,000,000 shares of 5s. each, and the offer of up to 6,800,000 shares to shareholders at a price to be determined by the directors.

Since that date, however, the board, after consultation with the underwriters, has decided, in order to overcome certain practical difficulties, to offer the proportion of the new shares which would otherwise have been available to companies which are shareholders in Harmony for direct subscription by the shareholders of those companies.

Accordingly, an extraordinary meeting will be held on February 5 next, to consider the necessary proposals. It is also pointed out in the circular that the proposed new arrangement will not affect the rights of other shareholders to participate. Treasury permission has been obtained for the share issue, full particulars of which have yet to be announced.

Further details concerning the proposed new share issue are given on page 80.

**Stillfontein Quarterly Shows 97 Per Cent Payability.**—During the December quarter Stillfontein Gold Mining completed 10,451 ft. of development on the Vaal Reef from the Charles shaft. Of the 4,170 ft. sampled on the Vaal Reef, 4,040 ft. proved payable, equal to 96.9 per cent, averaging 59.3 dwt. over 5.5 in., equivalent to 326 in.-dwt. This result was the best the company has achieved for any quarter to date.

Development work began in the first quarter of last year and the following table summarizes the development results from the Charles shaft for the whole of last year.

1951	Total footage advanced	Sampled ft.	Payability per cent	in.-dwt.
Mar. qtr.	1,120	520	87.5	323
June qtr.	5,880	2,000	100.0	314
Sept. qtr.	8,689	3,345	100.0	264
Dec. qtr.	10,451	4,170	96.9	326

The report also announces that as the work on the Contact Reef Horizon from the Margaret shaft was interfering with the normal sinking of the shaft, it was stopped in November, but will be resumed during the current year. At the end of 1951 the Margaret shaft had been sunk to a depth of 2,954 ft.

Capital expenditure for the quarter amounted to £1,096,743 compared with £797,971 in the previous quarter, giving a total expenditure for the year of £3,045,956.

**Burma Corporation.**—The directors of Burma Corporation in a circular to shareholders, state that they hope it will be possible to convene an extraordinary general meeting on February 28, for the purpose of considering a resolution placing the company in voluntary liquidation. The amount of work involved, however, is considerable, it is stated, which may necessitate the meeting being held a week or so later.

The resolution to be submitted to shareholders also includes authorizing the liquidator to sell the "B" shares in Burma Corporation (1951) and the residual assets in the U.K. of Burma Corporation (other than the shares of its wholly owned subsidiary, Non-Ferrous Metal Products, Ltd.) to Burma Mines, Ltd.

**Ultramar Completes Ten Oil Wells.**—Ultramar Co. is informed by its subsidiary company, Caracas Petroleum S.A., that S.A.P. Las Mercedes, in which Caracas Petroleum S.A. and The Texas Co. are jointly and equally interested, made the following well completions during the quarter to December 31, 1951:

	Completed as Oil Wells	Completed as Gas Wells	Abandoned	Total
Development Wells (Mercedes Field)	9	2	1	12
Exploration Wells	1	—	—	1

Two of the development wells have been completed as dual producers.

The exploration oil well is located about 40 kilometres East North East of the nearest proven producing area of the Mercedes Field.

At the end of the quarter under review four rigs operated on development drilling, one rig on exploration drilling and one rig on workover operations.

Production during the quarter amounted to 2,210,754 bbl. averaging 24,030 bbl. per day. The number of wells on production at December 31, 1951, was 191.

**British Tin Investment: British Tin Raises Dividend.**—The board of British Tin Investment Corporation has decided, subject to audit, to pay a final dividend of 18 per cent (12 per cent) making 27 per cent (19½ per cent) for the calendar year 1951.

The provisional net profit of the company and its subsidiary, after providing £280,750 (£194,510) for taxation, was £304,750 against £228,976. The dividend absorbed a net amount of £298,396 compared with £225,771 previously.

**Kamunting's New Siamese Leases.**—Shareholders of Larut Tin Fields and of Rawang Tin Fields have been advised that the partners in the Bang Toe Joint Project in which both companies hold a one-third interest have concluded negotiations for the disposal of this area to Kamunting Tin Dredging. The consideration is approximately £80,000, payable in cash on the issue of the mining leases.

**Taiping—Kundang Agreement.**—Taiping Consolidated has announced that agreement has been reached with Kundang Tin Dredging concerning a proposal to mine approximately 292 acres of that company's property.

When the ore reserves of the present area are exhausted, which is expected to occur in about four months' time, the dredge will be dismantled and re-erected on the Kundang leases, which will then be dredged for the benefit of both companies on a profit sharing basis.

Allowing for normal conditions attending dismantling and re-erection, it is hoped that a commencement of dredging operations on the Kundang leases will be possible well before the end of 1953.

**Jantar's New Columbite Contract.**—The Jantar Nigeria Co. has announced that it has now concluded a contract to sell its columbite output for 1952 at a price equivalent to £1,040 per ton for 65 per cent combined columbium tantalum pentoxide, c.i.f. New York City. This compares with the price received last year of £832 per ton.

**Nigel Van Ryn Maintains Dividend.**—A preliminary statement from Nigel Van Ryn Reefs announces that the company at the forthcoming annual meeting will recommend the payment of five per cent (same) or 3d. per share in respect of the year to September 30, 1951. The credit balance to the profit and loss account was given as £24,044 against £8,125 and the carry forward as £7,973 against £9,808.

**Van Ryn Deep's Final Liquidation Distribution.**—Van Ryn Deep have announced that the fourth and final liquidation distribution will amount to 1s. 6d. per share. Cheques in payment will be posted on January 30.

**East Rand Gold, Coal and Estate to Wind Up.**—An extraordinary meeting will be held in Johannesburg on February 15 next, to consider a special resolution that the company be wound up voluntarily. If approved this course will enable a distribution to be made of the company's principal assets—its shareholding in Union Free State Coal and Gold Mines.

## RAMBUTAN, LTD.

### MR. STANLEY WICKETT'S REVIEW

The Forty-Sixth Ordinary General Meeting of Rambutan Ltd. was held on 16th January at the Registered Office, Redruth. Mr. Stanley Wickett (Chairman) presided.

The Report and Accounts for the year ended 30th June, 1951, having been circulated for the prescribed time, were taken as read, as was also the Chairman's Statement, circulated with the report and accounts, which was as follows:

The Accounts for the financial year submitted herewith show a gross profit of £39,128 after payment of Government Royalty of £10,326 to the Malayan Government in respect of tin ore sold during the year.

Provision for United Kingdom and Malayan Taxation required £23,310.

Shareholders received three dividends each of 5 per cent, and this absorbed £8,125 nett.

It will be seen that Malayan and United Kingdom Taxation absorbed the lion's share of the mining profit.

£1,530 has been written off Capital Expenditure, and £5,000 transferred to General Reserve.

After making these provisions the balance standing to the credit of Profit and Loss Account has been increased from £8,683 to £10,123, which the Directors propose to carry forward.

The returns for the current year have been:

July–September ... Output of Tin ore ... 310 piculs = 18½ tons.

You will have noted from the General Manager's Report that after prolonged negotiations with the State Government approval has been received for the issue of a Mining Lease over a portion of the Government road which passes through the property. This is subject to a satisfactory deviation of the road and the Government pipe-line.

As removal of these to a new site will set free ground containing good values in depth and will facilitate the general working of the Mine, the scheme, although costly, was approved by your Board and work on the deviation commenced in August.

I regret that there has been further delay by the Authorities in connection with the assessment of War Damage and no assessment of your Company's claim has yet been received. This is most disappointing and I trust that every effort will be made by the Authorities to complete assessments at an early date.

As shareholders are no doubt aware, a Goodwill Mission from the United States of America has recently visited Malaya. It is to be hoped that the study by the Mission of the conditions and facts on the spot will do much to create a better understanding between Malayan producers and the major tin-consuming country.

During the year under review bandits were very active in the vicinity of the Mine, and there were several major incidents. I feel sure that shareholders would wish me to express once more their gratitude to the Management, Staff, and all our employees for their courage and devotion to duty under such trying conditions.

The Statement of Accounts and Balance Sheet, together with the Directors' Report, were received and adopted.

## LAKE GEORGE MINING

## MARKED INCREASE IN TONNAGE RAISED

The Fifteenth Annual General Meeting of the Lake George Mining Corporation, Ltd., was held on January 15 in London, Sir Godfrey Fell, K.C.I.E., C.S.I., O.B.E., the chairman, presiding.

The following is an extract from his statement circulated with the report and accounts for the year to June 30, 1951—

The report of the acting general manager of Lake George Mines Pty., Ltd., Mr. Ireland, which has been in your hands for some days, gives detailed information regarding output, etc., and I need not recapitulate the figures. In broad outline, the year's operations resulted in a marked increase in the tonnage of ore raised, while the mill, operating for 49 more days than in the previous year and a higher daily milling rate, turned out a considerably larger tonnage of saleable products in the form of lead, zinc and copper concentrates, with higher recoveries also of gold and silver.

On the other hand, operating costs per ton milled again rose from a total of £A4 1.04s. to £A5 0.58s. As explained in the report, this rise is mainly due to increases of £A2 2s. per week in the State basic wage, which had the further effect of making the cost of equipment and mine stores much higher. But these figures exclude production bonus, which rose from £A3 11s. 4d. per week to £A8 2s. 2d. The basic wage is adjusted quarterly throughout Australia in accordance with variations in the cost index of clothing, rents, etc.

Shipments of concentrates rose, in the case of lead by 3,300 tons, of zinc by 9,452 tons, and of pyrites by no less than 12,652 tons. At the close of the year stocks of concentrates were higher than at the beginning by 1,826 tons and 55 tons respectively in the case of lead and copper but lower by 336 tons and 1,803 tons in the case of zinc and pyrites.

The group profit, which furnishes the best indication of the progress of the undertaking, rose from £498,813 to £977,339. The rise reflects not only the larger output but also the higher prices obtaining for the company's products.

The profit and loss account of the corporation, however, calls for a few words of explanation. The sum of £250,688, under the heading United Kingdom Income Tax, is the amount payable on the grossed-up dividends receivable; that is, before taking into account double taxation relief in respect of Australian tax suffered by Lake George Mines Pty., Ltd., on the profits out of which that company paid to the corporation the dividends of £400,000. The reserve towards future taxation of £100,000 includes £66,600 in respect of profits tax liability arising on profits distributed to date, but not payable till next year. The true figure of taxation, after relief, comparable with last year's figure of £110,845 is therefore £81,694, plus £66,600, a total of £148,294.

Turning to the other side of the profit and loss account, it will be seen that, although the dividends received from the operating company totalled only £400,000, the "profit for the year brought down" is shown as £707,135. The explanation is that, in order to comply with the provisions of the Companies Act, it is incumbent to show the amount of the charge for United Kingdom taxation in the profit and loss account before allowance is made for any relief in respect of taxation imposed elsewhere, in this case in Australia.

I have already referred to the increase from £498,813 to £977,339, in the group profit. The Australian tax charged on that profit has risen from £184,000 to £438,000. The recent Australian budget imposed an increase of 2s. in the £ in the overall rate of income tax, which after allowing for the abolition at the same time of the undistributed profits tax, will, so far as can be calculated here, add a further net increase to the total taxation charged on the subsidiary company, for the past financial year, of some £65,000.

## A FAVOURABLE REPORT

As regards geological examination, the mine has quiet recently had a brief visit from Mr. Conolly, an eminent geologist, who is reported to have expressed himself as optimistic in the matter of finding additional ore. His engagements unfortunately prevented him making a longer stay, but the directors of the operating company hope to secure his services for a longer period when he is again free.

You will wish to receive some information about the progress of the operating company during the current financial year. This continues satisfactory. For the 16 weeks ended October 21, 1951, 63,107 tons of ore were milled, an average of 15,777 tons for each four-weekly period. The output of concentrates for the same 16 weeks period amounted to 5,102 tons of lead concentrates, 8,952 tons of zinc concentrates, and 1,339 tons of copper concentrates. Shipments continue to be made as rapidly as vessels are available. The operating company has recently entered into satisfactory agreements for the sale of its products for the year 1952.

The report and accounts were adopted.

## GOLD COAST SELECTION TRUST

The Twenty-Second Annual General Meeting of the Gold Coast Selection Trust Ltd. was held on January 15 in London, Major General W. W. Richards, C.B., C.B.E., M.C. (the Chairman) presiding.

The following are extracts from his circulated statement:

The profit and loss account for the year ended September 30, 1951, shows that the profit which accrued to the company from realization of investments was £19,449. We received £86,628 by way of dividends, etc., on investments.

Certain of the quoted investments stood in our books at a price in excess of market values, and it has been decided to write such investments down to market values. It will be noted that the aggregate market value of the company's investments is above the book cost—in particular, large shareholdings in Amalgamated Bank Areas, Ariston Gold Mines, Bremang Gold, Marlu Gold and Gold Coast Main Reef.

In the past Gold Coast Selection Trust has confined its activities to West African interests, and although the scope for future activities in the Colony is by no means exhausted, your board has decided to widen the field of interests if and when favourable opportunities present themselves.

We have already paid an interim dividend of 3d. per unit of stock (5 per cent) and the board recommend the payment of a further dividend of 4½d. per unit of Stock (7½ per cent) for the year ended September 30, 1951.

Members will have read in the Press that, as a result of representations made by the Gold Coast Chamber of Mines, the Government has agreed to the Gold Coast gold mining industry selling 40 per cent of its monthly output of gold at premium prices on the "free" market. This follows similar concessions obtained from the South African and Rhodesian mines some time ago. This is proving of material benefit to the mines and counteracts to some measure the continued rise in costs of mining equipment and labour.

A resolution for increasing the company's authorized capital by £250,000 is being put forward in order that the directors may be in a position to accept any opportunities which present themselves for improving and extending the company's interests. Existing members will be given the opportunity of subscribing to any new issue of capital.

The report was adopted and the proposed increase of capital was approved.

## The Model 7 Universal

## AVOMETER

The world's most widely used combination electrical measuring instrument. Provides 50 ranges of readings on a 5-inch hand-calibrated scale fitted with an anti-parallax mirror. Guaranteed accurate to B.S. first grade limits on D.C. and A.C. from 25 c/s to 2 K/c/s. The meter will differentiate between A.C. and D.C. supply, the switching being electrically interlocked. The total resistance of the meter is 500,000 ohms.

CURRENT: A.C. and D.C.  
0 to 10 amps.

VOLTAGE: A.C. and D.C.  
0 to 1,000 volts.

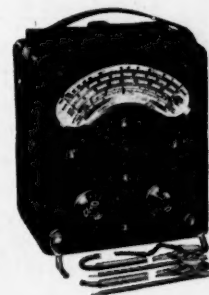
RESISTANCE: Up to 40 megohms.

CAPACITY: 0.01 to 20 mFds.

AUDIO-FREQUENCY POWER  
OUTPUT: 0—2 watts.

DECIBELS: —25Db. to +16Db.

The instrument is self-contained, compact and portable, simple to operate and almost impossible to damage electrically. It is protected by an automatic cut-out against damage through severe overload. Various accessories are available for extending the wide ranges of measurements quoted above.



£19 : 10s.

Size: 8" x 7½" x 4½"  
Weight: 6½ lbs. (including leads)

Write for fully descriptive pamphlet

Sole Proprietors and Manufacturers:

AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT Co. Ltd.  
WINDER HOUSE, DOUGLAS ST., LONDON, S.W.1. Phone. VICTORIA 3404-9

**HARMONY GOLD MINING CO. LTD.**

(Incorporated in the Union of South Africa.)

**NOTICE TO SHAREHOLDERS**

Notice is hereby given that an Extraordinary General Meeting of Harmony Gold Mining Company Limited will be held in the Board Room, Second Floor, The Corner House, Johannesburg, on Tuesday, 5th February, 1952, at 11 a.m., to consider, and if thought fit, to pass with or without modification the following ordinary resolutions, namely:—

- (A) That the ordinary resolutions under the heading of Special Business (Increase of Capital) passed at the First Ordinary General Meeting of the Company held on 2nd November, 1951, be and they are hereby rescinded.
- (B) That the Directors of the Company be and they are hereby authorized:—
  - (i) To offer 6,800,000 shares (being 4,000,000 reserve shares plus 2,800,000 of the new shares) or such lesser numbers as the Directors may deem advisable, for subscription by such person or persons and at such price or prices and upon such terms and conditions as the Directors may determine.
  - (ii) To negotiate and enter into an Underwriting Agreement with The Central Mining & Investment Corporation Limited on terms to be mutually agreed upon, and to allot and issue to The Central Mining & Investment Corporation Limited or its Nominees, in terms of any such Underwriting Agreement, any shares not taken up in response to any offer made in terms hereof, including all shares representing unallotted fractions arising out of any such offer.
  - (iii) To do all such things as may be necessary to give effect to the foregoing Resolutions, including the power to modify the terms of the aforementioned offer to such extent as may be requisite in order to comply with any requirements of the United Kingdom Treasury.

The following information is furnished in terms of Section 70 quin. of the Companies Act of the Union of South Africa, in regard to the interests of the Directors in the proposed Underwriting

Agreement with The Central Mining & Investment Corporation Limited:—

Mr. W. H. A. Lawrence is a Director and General Manager in Johannesburg of The Central Mining & Investment Corporation Limited and is the registered holder of 500 preference shares and 250 ordinary shares in that Corporation.

Messrs. W. M. Frames and G. V. R. Richdale are Managers in Johannesburg of The Central Mining & Investment Corporation Limited; Messrs. P. H. Anderson, E. J. F. Harrington and T. Reekie are Assistant Managers and Messrs. R. E. M. Blake-way, G. S. L. Burke, R. D'A. Clay and D. D. McIlidowie are officials of that Corporation.

The Transfer Books and Register of Members of the Company will be closed from 30th January to the 5th February, 1952, both days inclusive.

By Order of the Board, A. MOIR & CO., *London Secretaries.*  
LONDON OFFICE: 4, London Wall Buildings, E.C.2.  
12th January, 1952.

**Tanganyika Mineral Exports, October.**—Official returns of exports from Tanganyika were: Gold, 4,228 f.oz.; silver, 2,619 f.oz.; diamonds, 1,011 ct.; mica (sheet), 4.20 tons; tin concentrates, 8½ tons; tungsten concentrates, 0.15 ton; magnesite, 500 tons; salt, 627 tons; kaolin, 1½ tons.

**South African Mineral Output, October, 1951.**—Gold, 974,411 f.oz.; silver, 101,625 f.oz.; diamonds (Sept. sales), 117,210 ct.; coal, 2,929,053 s.tons; copper, 3,700 s.tons (99.47%); 95 s.tons in matte and concentrates; tin, 115 s.tons (68.20%); asbestos, 9,342 s.tons; chromium, 50,518 s.tons (44.88%); manganese, 73,368 s.tons (40.60%); lead, 67 s.tons (78.39%).

**TECHNICAL MINING ASSISTANTS.** Vacancies occur with a leading Gold Mining Company in West Africa for Technical Mining Assistants. Applicants preferably should hold a recognized Mining Degree. Permanent employment is offered with tours abroad of 12 months followed by 3 months' leave on full pay. Passages, furnished quarters and medical attention are provided free. There is a Pension Scheme in operation. Write stating age, experience and salary required to Box No. 8786, Whites, Ltd., 72/78 Fleet St., London, E.C.4.

**Banking with Barclays**

## Current, Deposit and other Accounts

### ... £1,284,691,537

A million pounds is by any standards a lot of money, and some whose daily business is not with figures find that anything more than a million is merely a confusion of numbers. But our Balance Sheet for 31st December shows well over twelve hundred and eighty million pounds as the total of our customers' accounts with us. Many of these accounts are very large ones, many others very small, but in the aggregate they represent a volume of confidence of which we are proud; and each individual account, large or small, has an equal claim upon our services, irrespective of its balance as expressed in pounds, shillings and pence.

**BARCLAYS BANK LIMITED**

# Metal and Mineral Trades

## THE BRITISH METAL CORPORATION LIMITED

HEAD OFFICE  
PRINCES HOUSE, 93 GRESHAM STREET, LONDON, E.C.2  
Tel. Monarch 8055

AND AT  
17 SUMMER ROW, BIRMINGHAM  
Tel. Central 6441  
47 WIND STREET, SWANSEA  
Tel. Swansea 3166

### OVERSEAS ASSOCIATES

THE BRITISH METAL CORPORATION  
(AUSTRALIA) PTY., LIMITED  
SYDNEY, PERTH AND MELBOURNE

THE BRITISH METAL CORPORATION  
(CANADA) LIMITED  
MONTREAL

DREW, BROWN LIMITED  
MONTREAL AND TORONTO

THE BRITISH METAL CORPORATION  
(INDIA) LIMITED  
CALCUTTA AND BOMBAY

THE BRITISH METAL CORPORATION  
(PAKISTAN) LIMITED  
KARACHI

THE BRITISH METAL CORPORATION  
(SOUTH AFRICA) (PROPRIETARY) LTD.  
JOHANNESBURG

C. TENNANT, SONS AND CO.,  
OF NEW YORK,  
NEW YORK

## THE COMMERCIAL METAL COMPANY LTD

66 GRESHAM STREET, LONDON, E.C.2

ORES, METALS (Ferrous and Non-Ferrous), METAL ALLOYS, etc.

Telephone: MONARCH 0211 (8 lines)

(Members of the London Metal Exchange)

Cables: COMETALCO LONDON

## EASTERN SMELTING CO. LTD.

CAPITAL—AUTHORISED £500,000: £435,000 ISSUED

Head Office: ST. SWITHIN'S HOUSE, 11/12 ST. SWITHIN'S LANE, LONDON, E.C.4

Telephone: MANsion House 2164/7

Telegrams: TIMAMASA, PHONE LONDON

### TIN SMELTERS

BRANCHES THROUGHOUT THE MALAY STATES

Sole Selling Agents: VIVIAN, YOUNGER & BOND, LIMITED, 8 BASINGHALL STREET, LONDON, E.C.2

Telephone: MONarch 7221/7

*Contractors for Ores Concentrates Residues*  
*containing*

ZINC COPPER · **LEAD** · ANTIMONY · WOLFRAM

**LEOPOLD LAZARUS LTD**

CREECHURCH HOUSE · LONDON · E.C.3  
Tele: AVENUE 5341 · Cables ORMINLAZ. LONDON  
Offices at: SYDNEY · JOHANNESBURG · CALCUTTA

**EVERITT & Co. Ltd.**

Tel. Address: Persistent, Liverpool

40 CHAPEL STREET  
LIVERPOOL  
Phone: 2996 Central**SPECIALITY:****MANGANESE PEROXIDE ORES**

We are buyers of:

**WOLFRAM, SCHEELITE, VANADIUM,  
MOLYBDENITE, ILMENITE, RUTILE,  
ZIRCONIUM and TANTALITE ORES**

Suppliers of:

**FERRO-ALLOYS & METALS, NON-FERROUS ALLOYS****GEORGE T. HOLLOWAY Co. Ltd.****Metallurgists & Assayers****ORE TESTING, WORKS AND METALLURGICAL  
RESEARCH LABORATORIES****Atlas Road, Victoria Road, Acton,  
LONDON, N.W.10**Telephone:  
ELGAR 5202Grams and Cables:  
NEOLITHIC LONDON**ROURA & FORGAS, LTD.**Telephone Nos:  
HOLBORN 6517-9

Sole Sterling Area Suppliers of

**ITALIAN QUICKSILVER****HANOVER HOUSE,****73-78, HIGH HOLBORN, LONDON, W.C.1****LEONARD COHEN LTD.****GOLD, SILVER AND THE PLATINUM METALS  
ORES, CONCENTRATES AND RESIDUES  
METAL HARDENERS  
NON-FERROUS METAL INGOTS**

London Office:

**1 HAY HILL, W.1**

Telephone: GROSVENOR 4384

Works:

**PORTH, GLAM**

Telephone: PORTH 280

**E. M. JACOB & CO. LTD.**

International Importers of all:

**NON-FERROUS ORES, MINERALS,  
RESIDUES, MATTES, SLAGS,  
BY-PRODUCTS, SCRAP METALS**

★

**79 Bishopsgate, London, E.C.2**

Phone LONDON WALL 9341/3 Grams: "JACOMETA, LONDON"

International Smelters and Buyers of

**SCRAP METALS AND  
RESIDUES**SLAG  
SKIMMINGS  
DROSSES  
SWEEPINGS  
ASHES  
BY-PRODUCTS**INTERNATIONAL SMELTERS LTD**

Christchurch Road, London, S.W.19

Phone: Mitcham 2181

Wire: Intersmelta, Phone, London.

**MINING & CHEMICAL PRODUCTS, LTD.****MANFIELD HOUSE, 376, STRAND, W.C.2**

Telephone: Temple Bar 6511/3

Telegrams: "MINCHEPRO, LONDON"

Works: ALPERTON,

WEMBLEY, MIDDLESEX

**Buyers of Silver Ores and Concentrates**

Smelters and Refiners of

**BISMUTH****ORES, RESIDUES & METAL**

Manufacturers of:

**FUSIBLE ALLOYS, SOLDER, WHITE METALS,  
ANODES OF TIN, CADMIUM and ZINC IN  
ALL SHAPES**

Importers and Distributors of:

**ARSENIC BISMUTH CADMIUM  
CAESIUM SALTS INDIUM SELENIUM  
TELLURIUM THALLIUM****LEAD****H. J. ENTHOVEN  
& SONS, LTD.****Smelters and Refiners**

- **ANTIMONIAL LEAD**  
for the Battery Trade
- **LEAD ALLOYS**  
for the Cable Trade
- **PRINTING METALS** ● **SOLDERS**

City Office: 89 Upper Thames St., London, E.C.4.

Telephone: Mansion House 4533. Telegrams: Enthoven, Phone, London

Works: Rotherhithe, Croydon &amp; Derbyshire

## ZINC SHAVINGS GRANULATED & POWDERED NON-FERROUS METALS

"Lead Wool" for Pipe-jointing.  
Metallic Packing for Pumps, etc.

**THE LEAD WOOL CO., LTD.**  
**SNODLAND KENT**

Telephone: Snodland 84216 & 7 Telegrams: "Strength, Phone, Snodland"

## WOLFRAM ORE TIN ORE

**FELIX KRAMARSKY CORPORATION**

39 BROADWAY  
NEW YORK 6, N. Y.

Cable Address: Orewolfarm

## MAYBANK METALS LTD.

This Company backed with the vast experience gained in a 100 YEARS of progressive trading, will expedite all orders...

**THE BUYING OF MIXED OR SORTED NON-FERROUS SCRAP METALS** and Supplying of Finely Graded Non-Ferrous Scrap to Your Requirements.

## MAYBANK METALS LTD.

STAR WORKS, SPURGEON STREET, SOUTHWARK  
LONDON, S.E.1 Telephone: HOP 3432/3  
HOP 4122/4

## ROKKER & STANTON LTD.

DRAYTON HOUSE, GORDON STREET  
LONDON, W.C.1

Metal Stockists & Shippers  
for

**BRASS, COPPER, ALUMINIUM  
AND NICKEL SILVER**

in

Sheets, Rods, Tubes, Strip, Wire, etc.

Associated Companies in Holland and Belgium;  
also Regd. in South Africa and Rhodesia.

Tele FUS 4751/2 Cable: BENTLY 2nd; A.B.C.4  
Grams: ROKKER, WESTCENT, LONDON

"Tropag"

ASBEST- & ERZIMPORT OSCAR H. RITTER K. G.  
Hamburg Ballindamm 7

Importers of

**ASBESTOS-ORES-MINERALS**

## PLATT METALS LTD.

METAL MANUFACTURERS and MERCHANTS

Buyers of  
BRASS ROD SWART AND SCRAP, and all descriptions of  
NON-FERROUS SCRAP METALS, BORINGS AND  
RESIDUES

Sellers of  
BILLETS AND INGOTS TO ANY REQUIRED COM-  
POSITION, GRADED NON-FERROUS SCRAP METALS

**METALEX WORKS, Great Cambridge Road,  
ENFIELD, Mddx.**

Telephone: ENfield 3425 (5 lines)

Telegram: Walton, Enfield

## ENTORES, LIMITED

KINGS HOUSE, 36 & 37 KING STREET,  
LONDON, E.C.2

**NON-FERROUS METALS  
ORES · RESIDUES**

Telegrams:  
Entores, Phone, London

Telephone:  
MONarch 3415

G

★

★

★

**METALS**

**ORES**

**MINERALS**

*of every*

*description*

**J.C. Gilbert Ltd.**

**COLUMBIA HOUSE, ALDOWYCH  
LONDON, W.C.2**

MONTREAL RIO DE JANEIRO NEW YORK SYDNEY BUENOS AIRES HONG KONG

Branches of the British Export Trade Association



**SMELTERS and REFINERS**  
**CONCENTRATES. SLAGS**  
**MINING BY-PRODUCTS**  
 PRODUCERS OF  
 SILVER SOLDERS, FLUXES  
 NON FERROUS INGOTS

**SHEFFIELD SMELTING CO. LTD.**  
 SHEFFIELD LONDON

ROYDS MILL STREET SHEFFIELD, 4

### CONSULTING METALLURGISTS

A.I.D. & A.R.B. Approved for  
 MECHANICAL TESTING  
 METALLURGICAL ANALYSIS

**ACLOQUE & Co.**

26 Bloomsbury Way, London, W.C.1 HOLborn 4487

### H. BARNETT LTD.

VICTOR ROAD, LONDON, N.7.

IMPORT : EXPORT

Phone: ARCHWAY 5461 (5 lines) Established 1865

**WE SPECIALISE IN ALL NON-FERROUS  
 SCRAP AND INGOT METALS**

### ELTON LEVY & CO. LTD.

**METALS \***

**\* ORES**

**\* TAILINGS**

**\* DUMPS**

**\* RESIDUES**

**\* SCRAP**

1-4 ST. ERMIN'S (WEST SIDE), CAXTON STREET,  
 LONDON, S.W.1

Phone: WHITEhall 9621/2/3 Grams: Eppendale, Sower, London

### THE STRAITS TRADING COMPANY LIMITED

Head Office:

P.O. Box 700, OCEAN BUILDING, SINGAPORE

Works:

SINGAPORE & PENANG

"The Straits Trading Co., Ltd."  
 Brand of Straits Tin

### THE BRITISH TIN SMELTING COMPANY, LIMITED

Works: LITHERLAND, LIVERPOOL

**Smelters of Non-ferrous Residues and Scrap**

London Agents:

**W. E. MOULSDALE & CO., LTD.**

2 Chantry House, Eccleston Street, London, S.W.1

Cables: Wemoulanco, London

Telephone: SLOane 7288/9

### AGENCE MINIERE ET MARITIME S. A

2, rue Van Bree, Antwerp. Telegr.: RENTIER, Antwerp.

**ORES** - Weighing - Sampling - Assaying  
**METALS** - Chartering, Shipping and Forwarding Agents  
**RESIDUES** - Stevedores

Engineering, Mining and Milling Equipment Agents

Telephones: HOP 1071 (2 lines) CANONBURY 3956 Cables & Telegrams: LUNZMETAL, LONDON

### S. B. LUNZER & CO., LTD.

Members of The National Association of Non-Ferrous Scrap Merchants

IMPORTERS NON-FERROUS METALS : SEMIS EXPORTERS

INGOTS : SCRAP AND RESIDUES

Office: WESTMINSTER BANK CHAMBERS, LONDON BRIDGE

LONDON S.E.1.

Warehouse: 16b ST. PAUL'S PLACE, CANONBURY N.1.

## HENEAGE METALS

*for Quality Ingots*

IN BRASS, GUN METAL  
 & PHOSPHOR BRONZE.

PHONE ASTON CROSS 1177/8

HENEAGE METALS LTD. HENEAGE ST. BIRMINGHAM

### DEERING PRODUCTS LTD.

8 GREAT SMITH STREET, LONDON, S.W.1

**ORES - MINERALS - REFRACTORY  
 RAW MATERIALS**

Telephone: ABBEY 2681/2

Cables: PRODEERING, LONDON

### BRITISH UNICORN LTD. BERYLLIUM SMELTING Co., Ltd.

METALS — MINERALS — SCRAP

CERIUM MOLYBDENUM NICKEL TUNGSTEN

36/38 Southampton Street, Strand, LONDON, W.C.2

Telephone: AMHERST 2211 (six lines)

## E. AUSTIN & SONS

(London) LIMITED

**ATLAS WHARF**

**Hackney Wick, London, E.9**

*Are Buyers of all scrap*

**NON - FERROUS METALS,  
 GUNMETAL, ALUMINIUM,  
 COPPER, BRASS, LEAD, Etc.**

*Manufacturers of*

**INGOT BRASS, GUNMETAL  
 & COPPER ALLOYS, INGOT  
 LEAD, TYPE METAL, ZINC,  
 Etc.**

**ORES  
METALS  
FERRO-ALLOYS**

MANGANESE  
CHROME  
TUNGSTEN  
ANTIMONY  
TANTALITE  
COLUMBITE  
ZINC  
LEAD  
COPPER



*Philipp Brothers, Inc.*

70 PINE STREET • NEW YORK 5, N. Y.

Offices: AMSTERDAM • BUENOS AIRES • CALCUTTA • LA PAZ • MONTREAL • LIMA • TOKYO

**WANTED  
by METALLO**

ALL NON-FERROUS

ORES • RESIDUES • MATTES • TAILINGS  
SLAGS • BY-PRODUCTS • SCRAP METALS

BUYERS & REFINERS

Exporters of Non-Ferrous Virgin Metals & Chemicals for the Mining Industry.

**METALLO CHEMICAL REFINING CO., LTD.**  
BALTIC HOUSE, LEADENHALL STREET, LONDON, E.C.3.

Telephone: ROYAL 56117

Telegrams: METALREFIN, TELEX, LONDON

Foreign Telegrams: METALREFIN, LONDON

Teleprinter: United Kingdom—ROYAL 1019

Continental—LONDON, TELEX 9142

Associated Companies in New York

Brussels

Amsterdam

Milan

Tel-Aviv

Agents all over the World.



## TOP RESULTS IN MEDIA RECOVERY— WITH \*LOW-HEAD WASHING SCREEN

NOW ALSO BUILT IN ENGLAND

LOW-HEAD screens are widely used for draining or washing media from ore in heavy density application . . . for screening log washer products . . . for wet or dry sizing, rinsing and dewatering semi-fine to semi-coarse ores and aggregates

- HORIZONTAL OPERATION
- ENTIRE SCREEN BODY "STRESS RELIEVED"
- CABLE OR FLOOR MOUNTED
- SCREEN SURFACES FOR ABRASIVE ORES



\* Hydrocone Crusher



Jaw Crusher



\* Taxrope Drives



Mills

ALLIS-CHALMERS MANUFACTURING COMPANY offer products of quality and integrity as the builders of the world's widest range of major industrial equipment. For ALLIS-CHALMERS builds complete power generation, distribution and control equipment—pumps—motors—V-Belt Drives—Crushing, cement and mining equipment—flour milling, food and chemical processing equipment—in all over 1,600 different products.

ALLIS-CHALMERS representatives will gladly look over your operation, show you how you may be able to reduce your operating costs with well integrated equipment.

\* Low-Head, Hydrocone and Taxrope are ALLIS-CHALMERS Trademarks

# ALLIS-CHALMERS

Distributors throughout the World



For information, call or write:  
ALLIS-CHALMERS MFG. CO.,  
728 Salisbury House,  
London Wall,  
London, E.C.2.

\*Phone: MO Narch 0186



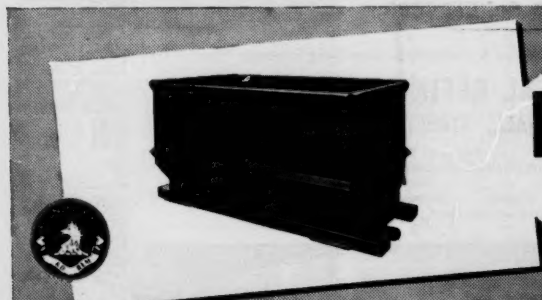
## MOBILITY ... COMFORT ... EFFICIENCY

Illustrated is a typical survey unit for use in the Western Desert. We can supply units for all purposes, all climates and all operating conditions. Air conditioning fitted if required. Also: Heavy reconditioned Diesel or Petrol Vehicles; Diesel Pumps and Generators

## ROURA & FORGAS Ltd.

Hanover House, 73, 75 High Holborn, London, W.C.1  
Tel. HOL. 0517/9

Sole Export Distributors for the Coventry Steel Caravans Ltd.  
Also Distributors for Heavy Earth Moving Equipment, Disintegrators, etc.



## BUTTERLEY ALL STEEL PIT TUBS

THE BUTTERLEY COMPANY LTD. • RIPLEY • DERBY • ENGLAND. London Office 20, ASHLEY PLACE • VICTORIA • S.W.1